

## **Attachment D.1. Risk Assessment**

Attached is the 'Former Finisklin Landfill Environmental Assessment Report' which was prepared by Malone O'Regan on behalf of Sligo County Council in March 2011. This report contains the detailed Risk Assessments undertaken in respect of the former landfill. Chapter 9 of the report outlines recommended measures.

Also attached is an Addendum to the above report dated May 2012 that contains the following information:

1. Results of six additional monthly landfill gas monitoring events that were completed between November 2011 and April 2012.
2. A remediation options appraisal to determine the optimum remedial solution to be installed in regards to passive landfill gas venting measures to be installed along the north eastern boundary of the site.
3. Proposed programme details for the implementation of the recommended remediation works.

# Former Finisklin Landfill Environmental Assessment Project



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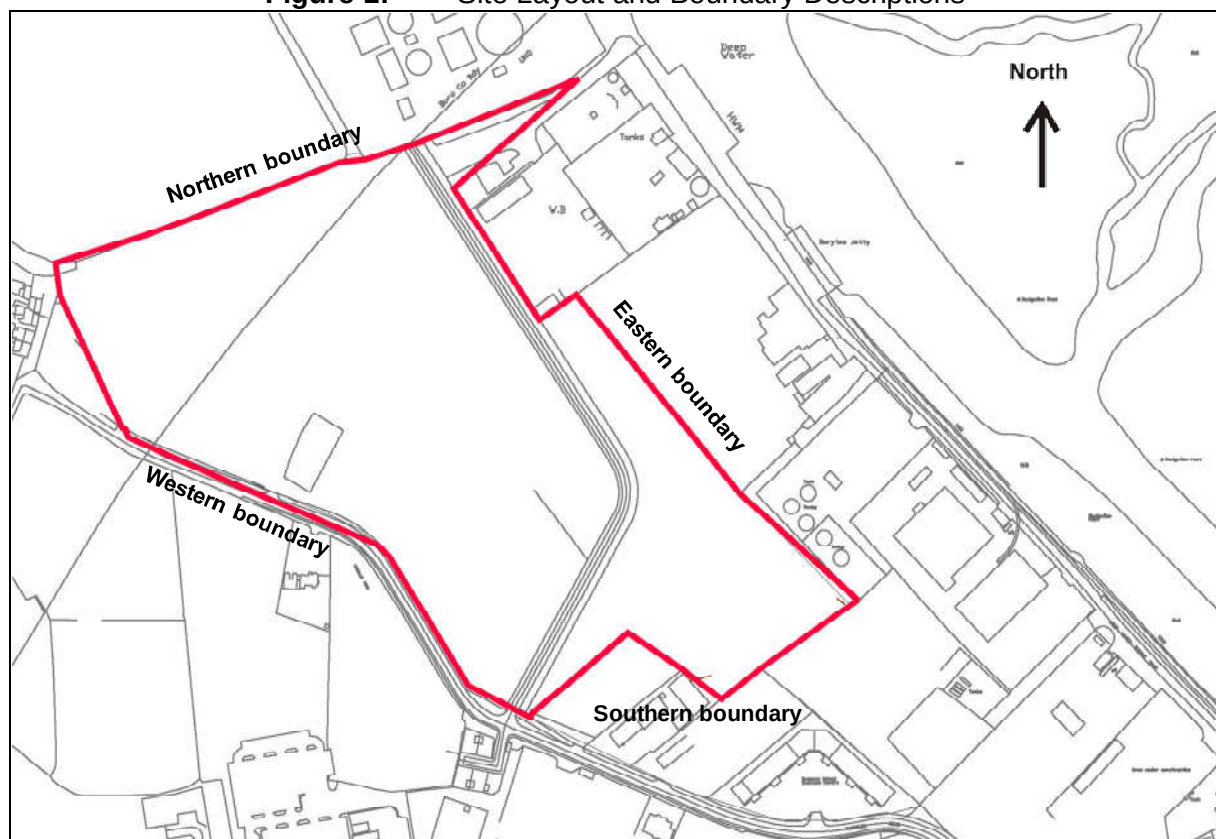
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## 1.0 INTRODUCTION

Malone O'Regan (MOR) was appointed by Sligo County Council to undertake an environmental assessment of Finisklin Landfill in accordance with the Environmental Protection Agency's (EPA) published Code of Practice: Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007) hereafter referred to as the 'Code of Practice'. In preparing this report, cognisance has also been taken of the Waste Management (Certificate of historic unlicensed waste disposal and recovery activity) Regulations (S.I. No. 524 of 2008) that were published in December 2008.

Finisklin Landfill is a closed landfill located on the outskirts of Sligo Town that was in operation from 1958 to 1999 and is subject to the Regulations (S.I. No. 524 of 2008) as it is in the ownership of Sligo County Council. The former landfill covers an area of approximately 13 hectares (ha) on the southern shores of the Garavogue River estuary approximately 1.5km north west of Sligo City Centre (refer Drawing 1). It is bordered to the north by Sligo Harbour and a new Wastewater Treatment Works (WWTW), to the east by commercial/industrial facilities located on Deepwater Berths Road, to the south by commercial/industrial facilities and to the west by Finisklin Road and a cul-de-sac in an area known as Far Finisklin (Figure 1).

**Figure 1:** Site Layout and Boundary Descriptions



## 1.1 Project Understanding

In accordance with the Code of Practice, Finisklin Landfill can be classified as a Category 1 landfill as it was operated by Sligo County Council without a waste licence in the period between 15<sup>th</sup> July 1977 and the introduction of the Waste Management Licensing Regulations in 1997 (without being in breach of national legislation). In this regard, Sligo County Council has responsibilities under the Code of Practice and Waste Regulations to assess the intrinsic risk of the former landfill.

Sligo County Council issued a Brief for the Appointment of Consultants in October 2008. This Brief identified that the duties of the consultant will include:

- *Produce a well-defined conceptual site model as detailed in chapter 3 & 4 of "The Code of Practice for the Environmental Risk Assessment of Unregulated Waste Disposal Sites".*
- *Carry out detailed site investigations and testing as per chapter 5 of "The Code of Practice for the Environmental Risk Assessment of Unregulated Waste Disposal Sites".*
- *Refine the conceptual site model and carry out a quantitative risk assessment as per chapter 6 of "The Code of Practice for the Environmental Risk Assessment of Unregulated Waste Disposal Sites".*
- *The Consultant appointed will be required to undertake the role of Project Supervisor Design Process (PSDP) as required under the Safety, Health and Welfare at Work (Construction) Regulations 2006. The Consultant appointed will be required to produce a site specific safety statement.*
- *Identify and consult all relevant bodies, agencies and interested parties/stakeholders. In developing the scheme Sligo County Council are committed to extensive consultation and the Consultant appointed will be required to assist in this regard. Consultations may include but will not be limited to:*
  - o *Local Authority Planning Department*
  - o *Local Authority Water and Wastewater Services Department*
  - o *Local Authority Heritage Officer*
  - o *Chief Fire Officer*
  - o *Local Authority Architects Department*
  - o *Local Authority Engineers*
  - o *ESB, Telecom Y Broadband Providers*
  - o *Local Authority Parks Department*
- *Provide detailed estimates of cost to Sligo County Council to carry out the various remediation options identified.*
- *Further to the preparation/completion of the final risk assessment and report the successful consultant will be required to advise on the potential future uses of the subject site.*
- *The Consultant appointed shall ensure that Sligo County Council is fully compliant with "The Code of Practice for the Environmental Risk Assessment of Unregulated Waste Disposal Sites".*

## **1.2 Report Objectives**

This report presents the findings of the Tier 1 Risk Screening Methodology, Tier 2 Site Investigations and Testing and the Tier 3 refinement of Conceptual Site Model (CSM) and Quantitative Risk Assessment (QRA) as detailed in the EPA's Code of Practice.

The overall objectives of the Tier 1 risk screening methodology were to:

- Identify the extent of the waste body;
- Identify possible Source-Pathway-Receptor (SPR) linkages through the development of a CSM;
- Carry out a risk screening exercise;
- Prioritise the former landfill as high, moderate or low risk and identify and examine specific SPR linkages;
- Complete a walkover survey of the former landfill to confirm or otherwise the assessment of the SPRs identified; and
- Inform the scope of the Tier 2 Assessment: Site Investigations and Testing.

The overall objective of the Tier 2 Site Investigations and Testing methodology was to:

- Provide sufficient information to determine whether a linkage exists and the significance of the linkage and the risk posed by the hazard (waste type).

The overall objectives of the Tier 3 refinement of the CSM and Quantitative Risk Assessment were to:

- Refine the CSM using all of the information gathered during the Tier 2 Site Investigation.
- Reapply the risk screening methodology to validate the risk classification if deemed appropriate.
- Complete a generic or detailed risk assessment if deemed appropriate.

### **1.3 Background Information Reviewed**

A large number of relevant documents were reviewed during this assessment that included the following:

- Proposed Central Landfill Site for Sligo Borough and Sligo County Council. J. Stewart, County Engineer (November, 1978).
- Initial Study Relating to the Extension of Finisklin Co-disposal Site. G.J. Salter (February 1991).
- Landfill Post Closure Monitoring – Reconnaissance Gas Survey – Report No. 98/13/B-3 – Geotechnical and Environmental Services Limited (GES) (March 1999).
- Landfill Post Closure Monitoring – Reconnaissance Gas Survey – Report No. 98/13/B-4 – GES (June 1999).
- Landfill Post Closure Monitoring – Site Investigation – Report No. 98/13/B-5 – GES (August 1999).
- Landfill Post Closure Monitoring – Gas Survey – Report No. 98/13/B-6 – GES (August 1999).
- Landfill Post Closure – Gas Control Options Report – Report No. 98-13-B-7 – GES (August 1999).
- Finisklin Landfill Site, Co. Sligo. Landfill Gas Migration Control – Assessment and Recommendation of Geotechnical Contractors Proposal – ie Consulting Engineers (May 2000).
- An Assessment of Intertidal Assessments in the Garavogue River and Estuary – Halia Oceanographic Consulting Services (May 2004).
- Site Contamination Survey – Minerex Environmental Limited (August 2004).
- Waste Permit – WP SO-05-39 (July 2005).
- Waste Permit – WP SO-06-55 (May 2006).
- Finisklin Landfill Closure Plan Preliminary Assessment – White Young Green (WYG) (March 2007).

### **1.4 Disclaimer**

The conclusions presented in this report are professional opinions based solely on the tasks outlined herein and the information made available to MOR. They are intended for the purpose outlined herein and for the indicated site and project. The report is for the sole use of the Client. This report may not be relied upon by any other party without explicit agreement from MOR. Opinions and recommendations presented herein apply to the site conditions existing at the time of the assessment. They cannot apply to changes at the site of which MOR is not aware of and has not had the opportunity to evaluate. This report is intended for use in its entirety; no excerpt may be taken to be representative of this assessment. All work carried out in preparing this report has utilised and is based on MOR professional knowledge and understanding of the current relevant Irish and European Community standards, codes and legislation.

## **1.5 Difficulties Encountered**

Please note that although extensive research was completed as part of this assessment, given the historic nature of filling activities, some information on the phasing of filling at the former landfill could not be established. Therefore, in evaluating the landfill gas risk and completing the landfill gas assessment, a number of assumptions have been made on the phasing of filling (e.g. annual tonnages accepted) and type of material and compaction. While these limitations are identified it is considered that the overall project objective was not compromised and the conclusions and recommendations presented are valid.

A conservative estimate supported by a legal opinion was made in identifying the extent of the former landfill that falls under the scope of the Code of Practice and relevant legislation; however this assessment was complicated by the fact that waste materials have been deposited external to the boundary of the former landfill.

## 2.0 TIER 1 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) was developed for the former Finisklin Landfill and possible sources, pathways and receptors along each of the source-pathway-receptor (SPR) linkages have been identified.

### 2.1 Source

The principal source of contamination in the case of a landfill can be considered to be the leachate and landfill gas produced as a result of the waste type, volumes and conditions present. Please note that the EPA consider that the hazard associated with pre-1977 sites is significantly reduced as the 'proportion of biodegradable waste contained in municipal waste was relatively low in that period and therefore the amount of leachate and landfill gas currently being generated is expected to be low' (EPA, 2007). Waste materials disposed of at the former Finisklin Landfill between 1977 and when it closed in 1994 are considered to have the potential to generate landfill gas and leachate.

Previous studies undertaken in 1999 determined that landfill gas was being detected at locations in and adjacent to the former landfill. Outfalls (possibly leachate) were also identified but not sampled during the investigative works. Therefore, for the purpose of this CSM it is considered that leachate and landfill gas production and migration represent a possible source of contamination at the former landfill and therefore require further assessment. Leachate and gas production are a function of a number of factors including the extent of waste, phasing of works and type of waste; further details are provided in the following sections.

#### 2.1.1 Extent of Waste – Historical Information

Historical information from reports, maps and aerial photographs provide information on the phasing of the development of the former Finisklin Landfill. A large number of reports were reviewed as part of this desk based study; some pertaining to the development of the site as a central disposal site and others with regards to the environmental quality of the former landfill. From a review of historical maps all of the land between Finisklin Road and Deepwater Berth Road has been reclaimed under a series of reclamation and filling projects completed since 1890.

A series of investigative works were completed by GES Ltd. in 1999 including '92 spike bar monitoring positions within the existing site, 19 gas monitoring trial pit wells within the site, and 41 auger drilled borehole locations external to the site along the existing boundary' (GES, 1999 (98-13-B-7)).

White Young Green (WYG) completed an assessment of available information for the former Finisklin Landfill in March 2007 and their findings concluded that:

- The landfill comprises of 12 ha of waste consisting of municipal solid waste and a relatively large percentage of C&D fill material.
- Results indicated that the adjoining commercial premises along the northern, eastern and south-eastern boundaries are constructed on waste materials comprising in general of C&D fill materials although MSW was recorded beneath some of these sites.
- Gas monitoring undertaken in the 1990s indicated that gas was being produced within the landfill and that it was migrating laterally through the subsurface and being recorded beneath lands owned by the adjoining commercial premises (although no modelling was completed to support this).



- Landfill gas was not identified on the western boundary; however, there were no monitoring stations along Far Finisklin (where an occupied residential dwelling is located).
- Reports indicated that landfill gas was not detected within the adjoining commercial buildings.
- It was reported that leachate was evident during low tide along the mudflats.

Historical maps examined during this desk based study included:

- Ordnance Survey Map dated 1910 which shows the presence of the Sligo Harbour Reclamation.
- Ordnance Survey Map dated 1942 (Drawing No. 2). The area of land reclaimed is identical to that identified in the 1910 map.
- Zoning Map dated 1973.
- Finisklin Dump Development (Sligo County Council) dated 1978.
- Sligo Town – Proposed New Roads dated 1979.
- Layout of Proposed Spoil Disposal Area (Sligo Harbour Commissioners) dated 1983.

A number of representative maps are presented in this report as they provide valuable details on the sequencing of filling including Map 2 of the Proposed Central Landfill Site (1978) (refer Drawing No. 3) and Figure 2 from the Initial Study Relating to the Extension of Finisklin Co-Disposal Site (1990) (refer Drawing No. 4).

Aerial photographs were also reviewed as part of this desk based study and include:

- Orthophotograph dated 2000.
- Orthophotograph dated 2004.
- Orthophotograph dated 2007 (Drawing No. 5).

The exact boundary of the original landfill which dates back to 1958, the area filled as part of reclamation works and the phasing of filling activities (i.e. annual tonnages) are unclear. However, in order to ensure that the boundary as presented in this report is correct, Sligo County Council retained the services of their legal advisor to undertake a review of all available information including leases. The boundary of Finisklin Landfill for the purpose of the Code of Practice is identified in Drawing No. 6 and is estimated to be 13 Hectares (Ha). Please note that it appears based on available information that waste materials have been deposited external to the boundary (refer Drawing No. 6); however, this land does not fall under the remit of the Code of Practice and associated legislation as firstly it was reportedly filled prior to the 15<sup>th</sup> July 1977 and secondly these lands were not under the control of Sligo County Council at the time of filling but rather Sligo Harbour Commissioners who were abolished in 2006. Please note, the identified boundary is a conservative estimate of the extent of the former landfill that falls under the scope of the Code of Practice and relevant legislation. A copy of this legal opinion is included in Appendix A.

#### *2.1.2 Phasing of Filling & Associated Infrastructure*

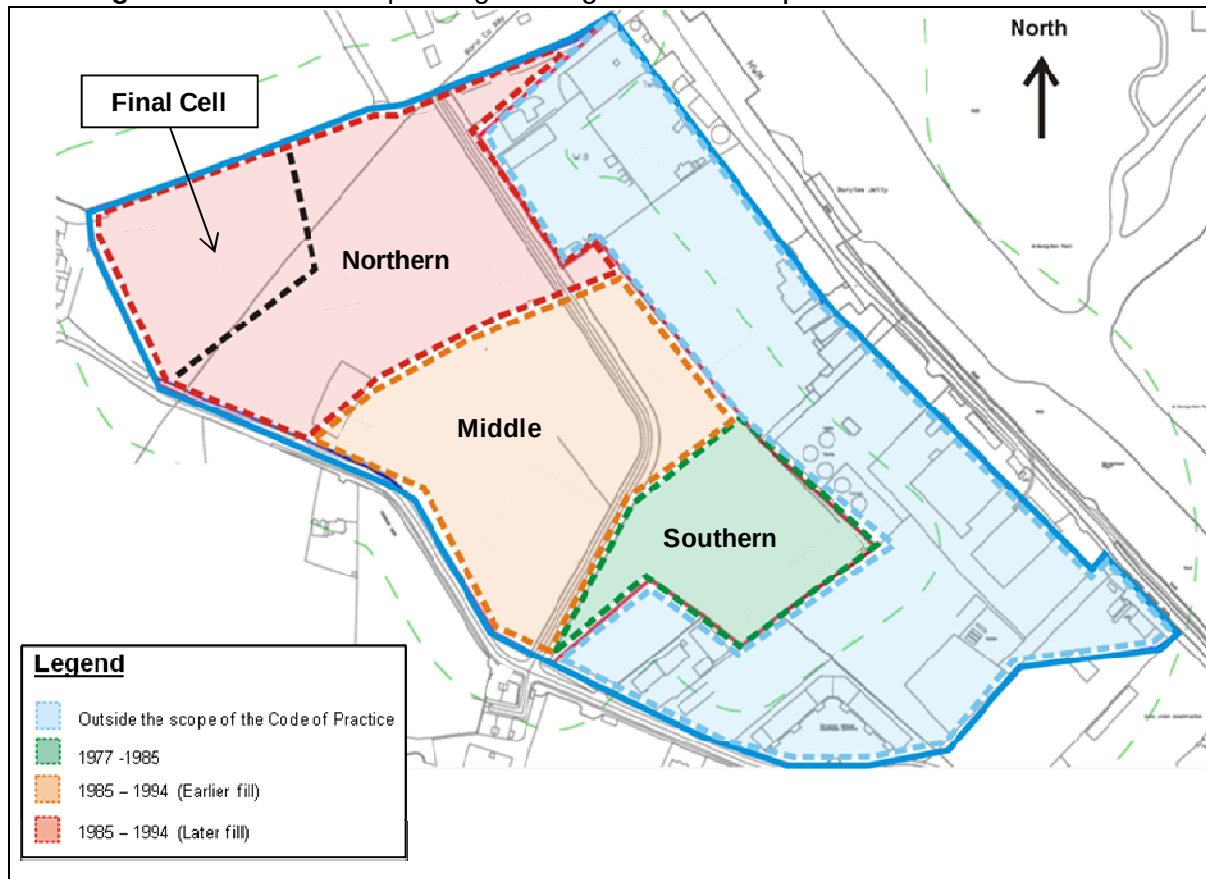
Based on available information it would appear that Sligo Harbour Commissioners, and subsequently Sligo County Council, operated the former landfill up until November 1994. There was no associated landfill infrastructure installed at the site, such as a landfill liner, leachate collection system, or gas collection, flaring or venting systems, although Drawing No. 4 indicates the presence of an internal bund wall between cells (1990). The land reclamation process was completed by depositing waste material directly on top of the existing mudflats and progressively filling into the estuary parallel to the shore.

The waste deposition or reclamation process can be divided into four phases (see Figure 2) as follows:

- Waste deposited between 1958 and 14<sup>th</sup> July 1977 which falls outside the scope of the Code of Practice.

- Waste deposited between 15<sup>th</sup> July 1977 and 1985 - southern portion of the site.
- Waste deposited between 1985 and 1994 (earlier filling activities) – middle portion of the site.
- Waste deposited between 1985 and 1994 (later filling activities) – northern portion of the site.

**Figure 2:** Inferred phasing of filling activities completed at the former landfill.



A large rock bund was constructed to function as the outermost boundary of the former landfill (into the harbour) and all filling activities were undertaken on the landside of this bund. This porous rock bund was designed and constructed with a seaward opening/entrance (approximately 30m width crest) (Salter, 1991). The function of this entrance was to allow the free flow of the tide to and from the cells in order to avoid the build-up of leachate within the unused cell and partially filled cells at that time i.e. a dilute and disperse principle. Drawing No. 4 (1990) illustrates the phasing of works during latter years of operation. A partially filled cell and an unfilled tidal cell are clearly visible in the western portion of the site and therefore these cells were completed between 1991 and 1994 and represent the more recent material (with the associated greater risk of landfill gas and leachate production). The location of an opening in the sea wall has also been indicated on the drawing.

### 2.1.3 Type of Waste

The composition of the waste materials deposited at the former landfill is reported to be mixed. The former landfill at Finisklin was used for the disposal of domestic wastes and commercial and industrial wastes during its operational lifespan. Sligo County Council (Salter, 1991) reported that in 1991 approximately 10,700 tonnes/annum of domestic waste plus approximately 2,000 tonnes/annum of commercial and industrial wastes were deposited at the former landfill per year and it is reported that this increased to 15,000 to 17,000 tonnes per annum in latter years (WYG, 2007). It is also reported that large amounts of C&D type fill material (clays, soils, stones, bricks, blocks, etc.) were deposited in many parts of the

landfill. The available information indicates that the thickness of the waste body varies from approximately 1.9m to 4.5m including the capping layer. Sligo County Council estimated in their landfill remediation questionnaire (April 2005) that the approximate total tonnage of waste materials deposited in the former landfill was 300,000 tonnes.

#### *2.1.4 Historical Gas Monitoring Data*

Historical gas monitoring was undertaken by Geotechnical and Environmental Services Ltd. during 1998 and 1999. This monitoring was carried out in standpipes installed within trial pits in the landfill and in boreholes outside the site. The data is limited (not least by the construction of standpipes in trial pits and many of the wells being open), however it does provide an indication of conditions within and around the site with regards to landfill gas generation. This data indicates that in wells installed within the site the ratio of carbon dioxide to methane was representative of higher gas generation in the northern part of the site and towards the centre of the site. Gas generation appeared to be much lower towards the edges of the site and in the older area of landfill at the southern end.

This data also indicates that there was no clear evidence of gas migration across the western boundary of the landfill. Although low concentrations of carbon dioxide were encountered in one well outside the northern end of this boundary these concentrations could have occurred due to the underlying bedrock (limestone). Low concentrations of gas were encountered in some wells in the industrial areas to the east of the site (outside the landfill) but the concentrations and ratio of methane to carbon dioxide are indicative of low levels of gas generation. The source of these low levels could be from the fill materials beneath these areas, although it is possible that there could also be a contribution from the landfill site given that they are located beside the most recently filled areas.

#### *2.1.5 Remediation Works*

Since Finisklin Landfill closed in 1994, Sligo County Council has permitted inert material (soil and stones) to be imported into the former landfill as part of the remediation capping works. These works were carried out by private contractors under waste permits (WP SO-06-55 and WP SO-05-39) issued in July 2005. Sligo County Council reported that this capping material varies in thickness from a few centimetres at isolated locations to 2 meters at other locations. No specific geochemical or capping design was completed in advance of these works (refer to Drawing No. 5 for an aerial photograph taken during 2007).

#### *2.1.6 Existing Site Conditions/Walkover Survey*

A walkover survey was completed by a Senior MOR Environmental Consultant on the 9<sup>th</sup> April 2009. The purpose of this walkover survey was to establish the current landuse at the site and the surrounding area and to confirm information compiled as part of the desk based study. The site inspection examined each of the possible Source-Pathway-Receptor linkages and attempted to delineate, from visual inspection, the extent of the waste body, to complete a preliminary assessment of leachate or possible gas generation and to inform the Tier 2 Risk Assessment Methodology: Site Investigation and Testing scope of works.

The site is not developed and is currently not in use. The surface of the landfill is generally flat at a few meters above sea level (c. 6 metres above ordnance datum (maOD)) with many local and relatively small undulations. The depth of material deposited at the former landfill as part of the capping activities is visible, in particular along the boundary with Sligo Harbour where approximately 2m of fill would appear to have been deposited.

The vegetative cover of the landfill varies. In the areas where a capping layer was deposited, the ground is generally covered with colonising grasses. The remaining areas of the landfill that did not undergo additional capping works are overgrown with weeds, grasses, shrubs, bushes and trees.

The western boundary of the former landfill has been landscaped with a stone wall and a line of trees with some commercial/industrial developments also present beyond the landfill boundary to the south, while the northern boundary bordering the estuary is protected with rock armour with the exception of the section that forms the boundary with the new WWTW. Much of the perimeter of the landfill along the eastern boundary has been redeveloped with the construction of a number of commercial/industrial developments along Deepwater Berths Road on the northern boundary. A road has also been constructed through the landfill to provide access to the new WWTW that was recently built to serve the needs of Sligo Town.

During the walkover survey, a number of outfalls/seepages were observed at low tide on the northern boundary entering Sligo Harbour from the landfill (refer Photograph No. 3). There was no evidence of landfill gas during the walkover survey (i.e. odour or vegetation die back).

## 2.2 Pathway

A pathway is a mechanism or route by which a contaminant comes into contact with, or otherwise, affects a receptor (BS10175:2001). The environmental setting described below reflects a combination of a desk based study and observations during the walkover survey and all have implications on the SPR linkages. In general, none of the maps from the Geological Survey Ireland (GSI) or EPA indicated the direct environmental setting for the former landfill primarily due to the fact that this is a filled/reclaimed site and therefore was outside the scope of their respective surveys. Hence, for the purpose of this section, given that direct information is unavailable for the entire site an inference has been made on the environmental characteristics of the former landfill from the values attributed to the former spit of land beneath part of the landfill or from the surrounding conditions and values.

### 2.2.1 Geology

#### *Quaternary Geology*

Based on the GSI/EPA Quaternary maps a portion of the former landfill is underlain by estuarine silt and clay (refer Drawing No. 7). It has been established from a review of historic Ordnance Survey drawings that this landfill footprint was formerly mudflats onto which the waste was directly deposited; this was confirmed during previous site investigations. Land adjacent to the former landfill to the west can be predominantly characterised by metamorphic till; however the land to the south and east was identified as made ground (including land reclaimed as part of earlier reclamation activities).

#### *Bedrock Geology*

Based on the GSI Bedrock maps the bedrock underlying the quaternary deposits generally comprise of the Glencar Limestone Formation which consists of argillaceous calcisiltites to very fine calcarenitic Limestone (Dinantian Upper Impure Limestones), which is interbedded with dark calcareous shale (refer Drawing No. 8).

### 2.2.2 Hydrogeology

#### *Aquifer Classification and Groundwater Flow Regime (horizontal pathway)*

The bedrock aquifer beneath the former landfill is classified by the GSI as a Locally Important Aquifer where the aquifer is moderately productive only in local areas (refer Drawing No. 9). Less than 1km from the former landfill, the aquifer is classified as a Regionally Important Aquifer which is karstified and dominated by conduit flow associated with the Dartry Limestone Formation of massive cherty calcarenite wackestone.

#### *Groundwater Vulnerability Rating (vertical pathway)*

Groundwater vulnerability provides a measure of the ability of contaminants to migrate vertically to an aquifer and is a function of the subsoil permeability and its thickness (EPA, 2007). The GSI has assigned a groundwater vulnerability rating of High (June 2010)

beneath the former landfill (refer Drawing No. 10). Areas of extreme vulnerability have been identified approximately 1km south of the former landfill.

#### *Groundwater Flow Direction*

Based on a review of available information, including the topographical gradient, the inferred groundwater flow direction is to the north east towards Sligo Harbour and the Garavogue Estuary.

#### *Groundwater Use and Protection*

A search of the GSI groundwater well database was conducted to identify registered wells within a 1km radius of the former landfill (Drawing No. 11). No wells were identified within the 1km zone. Sligo County Council also indicated that there were no drinking water sources in the area and that all houses are supplied by mains water.

The Groundwater Protection Scheme provides a framework for the protection of groundwater source zones (e.g. areas of contribution to water supply bores). The GSI Source Protection Area data indicates that there are no designated Source Protection Zones in the immediate vicinity of the former landfill (GSI, 2010).

#### *2.2.3 Hydrology*

Sligo harbour is located immediately at the northern boundary of the former Landfill. During the desk based study outfalls were identified on historic drawings (refer Drawing No. 4). From an examination of the rock armour during a period of low tide a number of direct surface water outfalls from the former landfill to Sligo Harbour were observed at the northern boundary. The approximate locations of the outfalls have been identified on Drawing No. 6.

Surface water (ponds and standing water), possibly as a result of the recent capping activities undertaken at the former landfill, was observed at a number of locations during the walkover. These locations have been identified on Drawing No. 6.

#### *2.2.4 Infrastructure*

Service ducts and infrastructure can provide a pathway for the migration of contaminants from the former landfill to identified receptors.

#### *Landfill Infrastructure*

Sligo County Council provided information on service infrastructure (i.e. pipes, cables, etc.) which are located within the boundary of the former landfill (refer Drawing Nos. 12a, 12b and 12c). There are a number of services located directly within the former landfill running along the access road to the WWTW and include a rising water main (refer Drawing No. 12a), foul and storm water drainage (refer Drawing No. 12b) and service cables for ESB and Eircom (refer Drawing No. 12c). In addition to the above, a combined sewer and service cables (ESB and Eircom) enter the site of the former landfill from Deepwater Berths Road between the former NCF site and Euroflow before joining up with the services running parallel to the WWTW access road (refer Drawing Nos. 12b and 12c).

#### *Surrounding Infrastructure*

Sligo County Council provided details on the associated infrastructure in the surrounding area (refer Drawing Nos. 12a, 12b and 12c). These drawings illustrate the approximate locations of services within 250m of the former landfill.

## **2.3 Receptor**

"A receptor is a person, living organism (e.g. livestock, crops, pets or wildlife), ecological system, controlled waters, atmosphere, structures and utilities that could be adversely

affected by the source" (EPA, 2007). A number of receptors have been identified that could be adversely affected by the former landfill at Finisklin.

### *2.3.1 Human Health Receptors – Current Landuse*

There are currently no onsite users. In general the area surrounding the former landfill consists of commercial/industrial developments with a number of industrial estates and one-off commercial/industrial units. In addition, there are a number of occupied residential properties within 50m of the former landfill located off Finisklin Road and one located in the cul-de-sac in Finisklin Far on the western boundary (refer Drawing No. 6).

### *2.3.2 Human Health Receptors – Future Landuse*

#### *Landfill Zoning*

In the current Sligo and Environs Development Plan (2010-2016), the former landfill has been zoned for mixed use in the western and south-western portion (refer Drawing No. 13). A larger area in the northern portion of the former landfill has been zoned as open space, while an area in the eastern portion has been zoned for port facilities and related uses. Note: In accordance with the relevant legislation the scope of this assessment focused on the current use of the land as opposed to any possible future use.

#### *Surrounding Zoning*

In the current Sligo and Environs Development Plan (2010-2016), the surrounding land has been zoned for a variety of uses including the development of Port Facilities to the east, public utilities and a small section of open space to the north, predominantly Business, Industry and Technology Parks to the west with a small amount of low to medium residential density, and finally mixed use (non retail) zoning to the south of the landfill (refer Drawing No. 13).

### *2.3.3 Hydrological Receptors*

#### *Garavogue River*

The Garavogue River Estuary which flows into the Harbour is located to the north of the former landfill beyond Deepwater Berths Road. The EPA hydrometric monitoring station (35012), located approximately 1.5km upstream of the site, at New Bridge (Sligo Town), has a mean annual flow of 12.91m<sup>3</sup>/s, for the period 2001-2009. Dry weather flow and long term 95%tile flow data are not available for this location. However, hydrometric station 35073, located approximately 5.5km upstream of the former landfill at Lough Gill, reports a dry weather flow of 0.8m<sup>3</sup>/s with flows of 1.859m<sup>3</sup>/s occurring 95% of the time, based on records from 1975 to 1997. The most recent Q rating for the River Garavogue at The Mall dated 2003 was Q4-5 at the bridge indicating unpolluted quality of water.

#### *Garavogue River Estuary*

The 2009 data for the Western River Basin district indicates that surface water ecological status is 'good' in the Garavogue Estuary and 'high' in Sligo Harbour, while surface water chemical status is 'good' in the Garavogue Estuary (Western River Basin District). The 2004 to 2006 survey of tidal waters (EPA, 2006) indicated that the quality of shellfish waters for human consumption in Sligo Harbour is Class B (intermediate quality), and that the Garavogue Estuary's trophic status is classified as 'intermediate'. Sampling carried out in Sligo Harbour and the Garavogue Estuary by Aquafact on behalf of Celtic Anglian Water indicated exceedances in concentrations of total and faecal coliforms, *E. coli* and Enterococci. The main possible sources were listed as wastewater treatment plants and stormwater runoff (Aquafact, 2009). Risks to or pressures on the water quality of the estuary include agricultural sources, wastewater and water treatment plants and quarries (Sligo County Council, 2010).

### Unnamed Stream

A stream is located approximately 650m to the south west of the former landfill and flows towards Gibraltar Point (refer Drawing No. 6). No water quality or hydrological information is available for this water body.

### 2.3.4 Protected Area Receptors – Surface Water Dependent Terrestrial Ecosystem

Sligo Harbour has been designated under the Habitats Directive as a Special Area of Conservation (SAC) and is included (in SAC number 00627) in the Cummeen Strand/Drumcliff Bay SAC (SAC number 00627) (Appendix B). In addition, Sligo Harbour has also been designated as a proposed Natural Heritage Area (pNHA). The designated areas for both the SAC and the pNHA are identical and the boundary can be seen on Drawing 14.

A portion of the former landfill and the adjacent harbour have also been designated a Special Protection Area (SPA) under S.I. No. 31 of 1995 (see Appendix B for Site Synopsis). This designation came into effect on the 10<sup>th</sup> February 1995 and it is our understanding that the boundary of this designation is currently under review by the National Parks and Wildlife Service (NPWS) (refer Drawing No. 15).

The Water Framework Directive requires that certain water bodies are identified and recorded in a Register of Protected Area. Sligo Bay is listed in the Register of Protected Areas for Species SPA and Recreational Waters, and the Garavogue River for Drinking Water Rivers (CAAS, 2009).

## 2.4 Preliminary Conceptual Site Model

A preliminary conceptual site model has been prepared for the former landfill. The following source, pathways and receptors identified for the former landfill are summarised in Table 1. A graphical representation of the CSM can be seen in Drawing No. 16.

**Table 1:** Preliminary Conceptual Site Model Summary for Finisklin Landfill

| Element          | Description                     | Rationale                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Source</b>    | Composition and extent of waste | <ul style="list-style-type: none"> <li>300,000 tonnes of municipal waste/ C&amp;D Wastes.</li> <li>size ~13 hectares (ha).</li> <li>Operational until November 1994.</li> <li>Evidence of leachate (visual outfall from former landfill).</li> <li>Evidence of landfill gas (previous studies).</li> </ul>                                                                                                                                                                              |
| <b>Pathway</b>   | Leachate Migration              | <ul style="list-style-type: none"> <li>Groundwater – High vulnerability.</li> <li>Direct connection to Sligo Harbour (SPA, SAC and pNHA).</li> <li>Evidence of leachate (visual outfall from former landfill).</li> </ul>                                                                                                                                                                                                                                                               |
|                  | Landfill Gas Migration          | <ul style="list-style-type: none"> <li>Some of the area surrounding the former landfill consists of made ground.</li> <li>Sligo County Council service infrastructure present.</li> <li>Previous assessments undertaken at the former landfill provide evidence of gas generation.</li> </ul>                                                                                                                                                                                           |
| <b>Receptors</b> | Leachate Migration              | <ul style="list-style-type: none"> <li>Human presence: residential properties located within 50m of the waste body therefore the potential for a drinking water supply – although unidentified to date. Locally important aquifer – although unlikely to be used for drinking water or agricultural purposes in this area due to the likelihood of saline intrusion.</li> <li>Surface water bodies within 50m.</li> <li>Protected area located within 50m of the waste body.</li> </ul> |
|                  | Landfill Gas Migration          | <ul style="list-style-type: none"> <li>Human presence: residential properties located within 50m of the waste body.</li> </ul>                                                                                                                                                                                                                                                                                                                                                          |

### 3.0 RISK SCREENING & PRIORITISATION

#### 3.1 Risk Screening

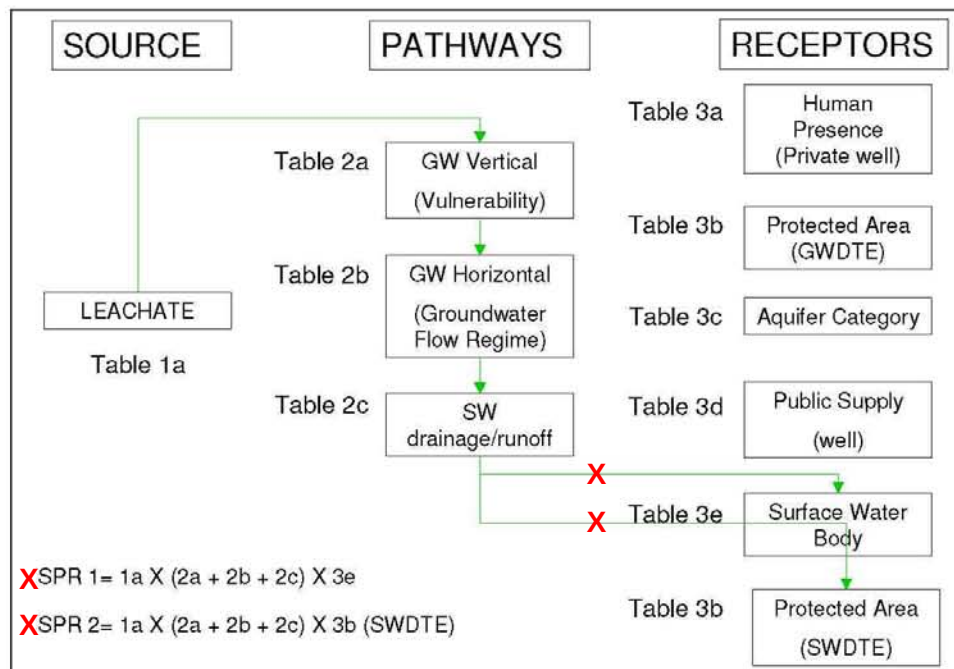
Risk screening represents an assessment of the SPR linkages in the conceptual model. Appendix C contains a copy of the risk screening exercise completed as part of this assessment of the former landfill at Finisklin.

#### 3.2 Risk Prioritisation

Risk prioritisation was completed for the former landfill at Finisklin in accordance with the Code of Practice. The risk prioritisation process assigns a score to each linkage where the overall site score is the maximum of the individual linkages. The scoring system allocates higher numbers for the higher risk elements and thus it allows a meaningful comparison to be made between different linkages (EPA, 2007).

The following tables illustrate the 11 possible SPR linkages which were scored individually for Finisklin Landfill, if present. The result calculated provides an indication of the relative risk associated with the SPR linkage at the former landfill. For the former landfill, 6 No. of these SPR linkages were valid. It was determined from the desk based study that SPR1, SPR2 which assess the risk of SWD to a surface water body, SPR4 which assesses the risk to groundwater dependent terrestrial ecosystems (GWDTE) and SPR6 which relates to a public supply well were not valid for this assessment as none were identified within the study area. It was also determined that SPR11 was not valid as the site is unoccupied and therefore there are no onsite receptors for landfill gas.

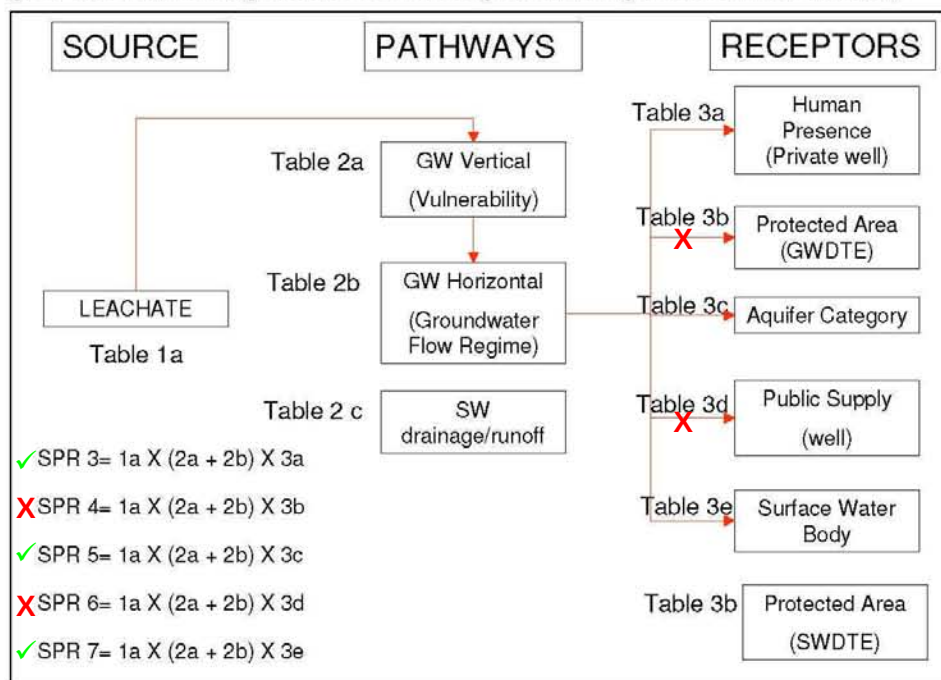
**Table 2:** Network Diagram for Leachate Migration through combined groundwater and surface water pathways (taken from Code of Practice (EPA, 2007))



Surface water drainage (SWD) channels associated with the mudflats were identified on historic maps, however SWD to a surface water body or a protected area were not identified. The direct drainage of leachate from a landfill to a surface water body is assessed in SPR8 and SPR9.

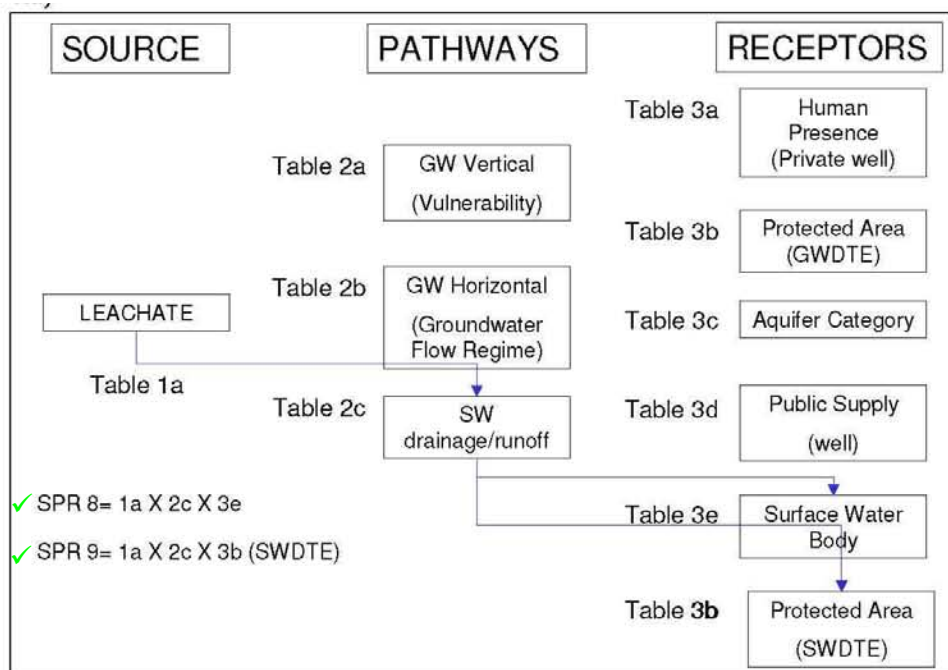


**Table 3:** Network Diagram for Leachate Migration through Groundwater Pathway (taken from Code of Practice (EPA, 2007))



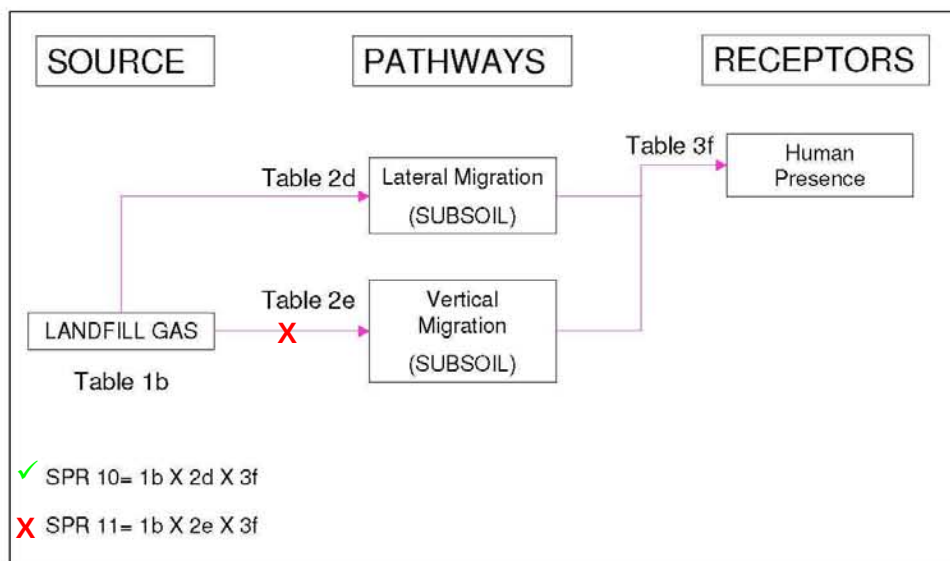
All of the SPR linkages identified in Table 3 have been included within this assessment with the exception of SPR 4 and SPR6. As discussed previously, these receptors have not been assessed as they were not identified within the study area.

**Table 4:** Network Diagram for Leachate Migration through surface water pathway (taken from Code of Practice (EPA, 2007))



All of the SPR linkages identified in Table 4 have been included within this assessment.

**Table 5:** Network Diagram for Landfill Gas Migration Pathways (Lateral and Vertical) (taken from Code of Practice (EPA, 2007))



All of the SPR linkages identified in Table 5 have been included within this assessment with the exception of SPR11.

Using the methodology developed by the EPA, the individual linkages were normalised to a rating of 100. Table 6 contains a summary of the results from the site prioritisation exercise.

**Table 6:** Site Prioritisation Summary

| SPR                     | Linkages                                 | Pathway via                                                        | SPR Value | Maximum Score | Normalised Score |
|-------------------------|------------------------------------------|--------------------------------------------------------------------|-----------|---------------|------------------|
| SPR1                    | Leachate ⇨ Surface Water                 | Combined groundwater and surface water                             | 0         | 300           | 0%               |
| SPR2                    | Leachate ⇨ SWDTE                         | Combined groundwater and surface water                             | 0         | 300           | 0%               |
| SPR3                    | Leachate ⇨ Human Presence (private well) | Groundwater Pathway                                                | 90        | 240           | 37.5%            |
| SPR4                    | Leachate ⇨ GWDTE                         | Groundwater Pathway                                                | 0         | 240           | 0%               |
| SPR5                    | Leachate ⇨ Aquifer                       | Groundwater Pathway                                                | 90        | 400           | 22.5%            |
| SPR6                    | Leachate ⇨ Public Supply                 | Groundwater Pathway                                                | 0         | 560           | 0%               |
| SPR7                    | Leachate ⇨ Surface Water                 | Groundwater Pathway                                                | 90        | 240           | 37.5%            |
| SPR8                    | Leachate ⇨ Surface Water                 | Surface Water Pathway                                              | 60        | 60            | 100%             |
| SPR9                    | Leachate ⇨ SWDTE                         | Surface Water Pathway                                              | 60        | 60            | 100%             |
| SPR10                   | Landfill Gas ⇨ Human Presence – off-site | Lateral and Vertical                                               | 150       | 150           | 100%             |
| SPR11                   | Landfill Gas ⇨ Human Presence – onsite   | Lateral and Vertical                                               | 0         | 250           | 0%               |
| OVERALL RISK SCORE      |                                          |                                                                    | HIGH      |               |                  |
| Risk Classification     |                                          | Range of Risk Scores                                               |           |               |                  |
| HIGH Risk (Class A)     |                                          | Score greater than or equal to 70% for any individual SPR linkages |           |               |                  |
| MODERATE Risk (Class B) |                                          | Score between 40% and 70% for any individual SPR linkages          |           |               |                  |
| LOW Risk (Class C)      |                                          | Score less than 40% for any individual SPR linkages                |           |               |                  |

Sites with a score greater than or equal to 70% for any of the site specific SPR linkages are considered to represent potential high risk or high uncertainty sites. The risk classification assigned to former landfill at Finisklin is Class A (High Risk) and represents the intrinsic risk that the former landfill poses to the environment. The linkages of greatest concern include the risk of leachate migration to surface water and protected areas, and landfill gas migration to off-site receptors, all with normalised scores of 100% indicating high risk.

## **4.0 SITE INVESTIGATION – FIELD WORKS**

### **4.1 Non-Intrusive Site Works**

#### *4.1.1 Geophysical Survey*

A geophysical survey was completed during May 2009 on the former landfill in Finisklin by Apex Geoservices. The primary objective in undertaking this survey was to assess the subsurface conditions including thickness and extent of waste.

The survey methodology included:

- EM31 ground conductivity surveying at nominal 10m line separations.
- Magnetic Survey of selected locations indicating very high conductivities in order to confirm the presence/absence of buried metal waste.
- Eight 2D resistivity profiles were carried out in order to provide information on the thickness of the waste materials and to try to identify any possible areas of leachate.
- Seismic refraction profiling was completed to provide information on the stiffness of the waste material and, combined with the resistivity data, provide information of the different strata underlying the site. In addition, multichannel analysis of the surface wave (MASW) processing was carried out to provide further information on the stiffness of the different layers and to provide Gmax and Shear wave velocity (Vs) values of the subsurface material.

In summary the geophysical data indicated that:

- The site is made up of soft to firm or loose to medium dense fill material comprising sandy silt/clay mixed with C&D waste and organic waste overlying estuarine sands and silts over saturated sands and gravels and moderately weathered shale bedrock.
- The thickness of fill material varies from 0.6m to approximately 10m.
- The highest concentration of C&D waste is located in the eastern portion of the site.
- Very conductive/possibly metallic material spread across the surface is located in the northwest and southeast of the site.
- Predominantly organic material is found in three localised zones in the centre of the site.
- The presence of leachate underlying the fill material could not be determined as it is likely to have similar low resistivity values when compared to estuarine sands and silts.

A copy of the report is included in Appendix D.

#### *4.1.2 Topographical Survey*

A topographical survey was completed of the former landfill during July 2009; a copy of the survey is included in Appendix E. The lowest point recorded in the survey was 2.15maOD (ground level) in the western corner, and the highest point recorded was 7.0maOD located in the north-western area of the site.

### **4.2 Intrusive Site Investigation and Monitoring**

The site investigation was undertaken in accordance with Section 7.6.2 of BS10175 - 2001 "Investigation of Potentially Contaminated Sites – Code of Practice" by MOR personnel. The site investigation was carried out in a phased manner; between June 2009 and February 2010. The scope of work completed is described in the following sections.

The identified potential contaminant sources associated with gas (risk to off-site human receptors) and leachate migration (risk to surface water and protected areas) were determined to be linked to the deposition of waste at the site; therefore gas, soil and water

investigations were completed to focus on these linkages and to establish the extent of the former landfill.

#### *4.2.1 Underground Utility Identification*

An underground utility identification and locating procedure was completed prior to initiating any ground disturbance activities at the site or in adjacent properties. This involved a review of any service drawings provided by Sligo County Council or owners of any adjacent properties, and the identification of manholes, drains and service installation trenches, as well as liaising with site personnel. All investigation locations were scanned for live underground utilities using a cable avoidance tool (CAT).

#### *4.2.2 Trial Pit Excavation*

Twenty-three trial pits (TP1 to TP23) were excavated at the site on the 16<sup>th</sup> and 17<sup>th</sup> June 2009 using a tracked excavator (Refer Drawing No. 17). Trial pits were excavated to depths ranging from 3.4 to 5.7 metres below ground level (mbGL). All trial pits were logged by a Senior MOR Environmental Consultant.

#### *4.2.3 Borehole Drilling*

The borehole investigation was undertaken on a phased basis. A track-mounted air rotary rig was mobilised to the site to drill deep boreholes (BH1 to BH4) at four locations on the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> June 2009. An open-hole rotary drilling method was utilised to advance all boreholes into bedrock to depths ranging from 13.0m to 14.1mbGL.

Fourteen probeholes were drilled across the site (BH5 to BH11 and BH13 to BH15) and in adjacent properties (BH16 to BH19) using direct-push window sample probes on the 17<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup> June 2009. The locations of the probeholes were selected based on the findings of the Tier 1 Risk Screening Methodology in order to target potential areas of environmental concern. The probeholes were advanced to depths ranging from 1.8m to 6.2mbGL. This method allowed accurate logging and sampling of in-situ soils. The probehole locations are shown on Drawing 18.

A Shell and Auger cable tool was mobilised to the site (on the 22<sup>nd</sup>, 23<sup>rd</sup> and 24<sup>th</sup> February 2010) to drill shallow boreholes (BH20 to BH25) at six locations external to the site boundary as part of more detailed characterisation work and to facilitate the installation of additional permanent landfill gas monitoring wells. These boreholes were advanced into made ground/natural soil to depths ranging from 3.5m to 5.0mbGL.

Details regarding the geological and hydrogeological conditions, including groundwater strikes encountered during drilling, were recorded by a Senior MOR Consultant and utilised in monitoring well construction design. Borehole records are included in Appendix F and their locations are shown on Drawing 18.

#### *4.2.4 Photo-ionisation Detector (PID) Screening Results*

PID screening results are presented on the borehole and trial pit logs (Appendix F). PID readings for the boreholes ranged from 0ppm at several locations to 3.7ppm at BH21 (1.5mbGL). PID readings for the trial pits ranged from 0ppm at a number of locations to 17.2ppm at TP15 (3.4mbGL).

#### *4.2.5 Soil/Waste Sampling*

Soil and waste logging and sampling was carried out by a Senior MOR Consultant in accordance with MOR Quality Management System (QMS) procedures which we certified to ISO 9001. Soil brought to the surface from the trial pits and boreholes was inspected and described according to BS5930 - 1999 'Code of Practice for Site Investigations'. Soil was inspected for visual and olfactory evidence of contamination. The subsurface conditions encountered including soil type, subsurface structures, any evidence of contamination and

water ingress were recorded and used for monitoring well construction design (where applicable). This information is presented on logs included in Appendix F.

Samples were collected for field testing and laboratory analysis. All soil samples were collected using best practice methods including the decontamination of sampling equipment between sample locations in accordance with MOR QMS procedures. Samples (14No.) were collected and sealed in appropriate laboratory supplied containers; samples were stored in cool dark conditions for transfer to Jones Environmental Forensics Ltd. (UK), a UKAS accredited laboratory for analysis. Split samples collected were screened for the presence of volatile organic compounds (VOCs) using a portable PID. PID results are included on the logs (Appendix F). Sample details including location and depth of samples were recorded on chain of custody records, copies of which are included in Appendix G.

#### **4.3 Soil Laboratory Analysis**

Samples (5No.) were selected for soil and soil leachate laboratory analysis for specific compounds based on PID results, visual and olfactory observations, type of material (e.g. made ground or natural) and the depth of the sample. The samples were analysed for the waste acceptance criteria (WAC) analytical suite for inert, non-hazardous and hazardous licensed waste facilities as follows:

*Soil:*

- total organic carbon (TOC);
- benzene, toluene, ethylbenzene and total xylenes (BTEX);
- polychlorinated biphenyls (PCBs);
- gasoline range organics (GRO), diesel range organics (DRO) / extractable petroleum hydrocarbon (EPH) including mineral oil; and
- polycyclic aromatic hydrocarbons (PAHs).

*Soil/Waste Leachate (CEN 10:1):*

- indicators and inorganics: chloride, fluoride, sulphate, dissolved organic carbon (DOC) and total dissolved solids (TDS);
- metals: antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc; and
- phenol.

#### **4.4 Groundwater Monitoring Well, Combined Leachate/Gas Well and Gas Monitoring Well Installation**

Four boreholes were converted to groundwater monitoring wells (BH1 to BH4), nine probeholes were converted to combined leachate/gas wells (BH5 to BH11 and BH13 to BH14) and six boreholes were converted to gas monitoring wells (BH20 to BH25).

Groundwater monitoring wells at the site were installed within the limestone bedrock aquifer and combined leachate/gas and gas monitoring wells were installed within made ground (waste/capping layer)/natural soils. The monitoring wells were constructed with 50mm PVC casing and machine slotted screen and were finished with heavy-duty, flush-mount or upright covers. Monitoring well installation was supervised by a Senior MOR Consultant. The groundwater monitoring wells were developed using a submersible pump following construction to ensure good hydraulic connection with the target aquifer and to remove excess suspended sediments. The combined leachate/gas wells and gas monitoring wells were completed with a landfill gas cap. Two gas monitoring wells were installed by MOR outside the landfill site boundary to the west of the site, 2No. to the east of the site, 1No. located to the south of the site and 1No. located to the north of the site. Monitoring well

completion details are included in Appendix F. The monitoring well locations are shown on Drawing 19.

In order to ensure that leachate would not migrate from the waste body to the underlying aquifer during drilling a number of measures were employed including:

- Casing off the landfill material during drilling.
- Careful design of the screened section of the wells to ensure that the wells are screened within the bedrock aquifer and do not straddle the waste layer.
- Using bentonite and cement bentonite grout to seal the borehole above the slotted casing and within the waste body to ensure that a pathway from the landfill to the bedrock aquifer was not provided.

#### **4.5 Site Investigation Location Survey**

The locations of BH1 to BH11, BH13 to BH19 and all of the trial pits were surveyed relative to Ordnance Datum and National Grid. The top of the well casing of the installed groundwater monitoring wells was surveyed to provide a fixed reference point (refer to Table 7).

#### **4.6 Environmental Monitoring**

##### *4.6.1 Groundwater Level Monitoring*

Gauging of groundwater levels in the monitoring wells was completed on a number of occasions between June 2009 and June 2010 using a Solinst water level meter. Data from these groundwater level monitoring events are included in Table 7. Continuous monitoring of groundwater levels was also carried out for BH1, BH2, BH3 and BH4 between the 25<sup>th</sup> June and the 15<sup>th</sup> July 2009 (Appendix J), for BH5, BH6 and BH15 between the 29<sup>th</sup> June 2009 and the 15<sup>th</sup> July 2009, and for BH1, BH5, BH8, BH10 and BH14 between the 22<sup>nd</sup> and the 25<sup>th</sup> June 2010 using submersible data loggers corrected for barometric pressure. All measurements were taken relative to the top of the well casing therefore results reported as metres below top of casing (mbtoc).

##### *4.6.2 Groundwater Monitoring*

Groundwater samples were collected from monitoring wells BH1 to BH4 (Drawing 19) on the 25<sup>th</sup> June 2009 and 16<sup>th</sup> July 2009. In order to ensure extraction of samples representative of formation water, each well was purged prior to sample collection in accordance with standard best practice methods and using dedicated equipment. During purging, water quality measurements of pH, electrical conductivity (EC), temperature, dissolved oxygen (DO), total dissolved solids (TDS), sodium chloride (NaCl) and oxidation reduction potential (ORP) were taken as well as notes on the physical appearance of the purged water.

After purging, the groundwater samples were decanted into labelled containers supplied by the laboratory. Due to the use of dedicated or disposable sampling equipment at each well, cross contamination was avoided. The sample containers were kept cool and in darkness and were sent to Jones Environmental Forensics Ltd. for analysis. In order to maintain sample integrity, a chain of custody record (Appendix H) was completed to track sample possession from time of collection to time of analysis.

Groundwater samples were analysed in the laboratory for a broad range of potential contaminants. The groundwater analytical suite closely followed the parameters as set out in Table C.2 for the EPA Landfill Monitoring Manual (2003) for 'Groundwater Baseline'. The groundwater analytical suite for this site included the following parameters:

- indicators and inorganics: sulphate, chloride, fluoride and total cyanide;
- ammonia;

- total oxidised nitrogen (TON);
- molybdate-reactive phosphorus (MRP);
- metals including arsenic, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, zinc, calcium, magnesium, potassium and sodium;
- volatile organic compounds (VOCs) including Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) and dichloromethane;
- semi-volatile organic compounds (SVOCs) including Polycyclic Aromatic Hydrocarbons (PAHs), phenols and phthalates;
- VOCs tentatively identified compounds (TICs) and sVOCs TICs;
- pesticides: atrazine and simazine;
- total and faecal coliforms;
- total dissolved solids;
- alkalinity as CaCO<sub>3</sub>; and
- total organic carbon (TOC).

#### 4.6.3 Leachate Monitoring

Leachate sampling was carried out on the 25<sup>th</sup> June and the 16<sup>th</sup> July 2009. Samples were collected from BH5, BH6, BH10, BH11, BH13 and BH14 (Drawing 19) and field parameters were measured on both occasions for all wells. Samples were collected using disposable bailers and decanted into labelled containers supplied by the laboratory. Due to the use of disposable sampling equipment at each well, cross contamination was avoided.

The sample containers were kept cool and in darkness and were sent to Jones Environmental Forensics Ltd for analysis. In order to maintain sample integrity, a chain of custody record (Appendix H) was completed to track sample possession from time of collection to time of analysis. Laboratory analysis was undertaken on leachate samples collected from BH6, BH11 and BH14.

Leachate samples were analysed for a broad range of potential contaminants. The leachate analytical suite closely followed the parameters as set out in Table C.2 for the EPA Landfill Monitoring Manual (2003) for 'Leachate Characterisation'. The leachate analytical suite for this site included the following parameters:

- indicators and inorganics: sulphate, chloride, fluoride and total cyanide;
- ammonia;
- TON;
- molybdate-reactive phosphorus (MRP);
- metals including arsenic, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, zinc, calcium, magnesium, potassium and sodium;
- VOCs including BTEX, dichloromethane;
- SVOCs including PAHs, phenols and phthalates;
- VOCs TICs and sVOCs TICs;
- pesticides: atrazine and simazine; and
- biological oxygen demand (BOD) and chemical oxygen demand (COD).

#### 4.6.4 Surface Water Monitoring

Surface water monitoring was conducted at four locations (SW1 to SW4) on the 15<sup>th</sup> July 2009. Two surface water samples were collected at low tide from two small seeps (outfalls) discharging from the northern boundary into the estuary from the toe of the retaining sea wall (SW1 and SW2). They are therefore indicative of discharging outfalls but are also influenced by their sampling location (i.e. mudflats etc). There was no direct discharge to the harbour that could be sampled. Two additional samples were collected from two on-site ponds (SW3 and SW4). The surface water monitoring locations are shown on Drawing 19.



During sample collection, water quality measurements of pH, EC, temperature, DO, TDS, NaCl and ORP were taken as well as notes on the physical appearance of the water samples. Surface water samples were collected and decanted into labelled containers supplied by the laboratory. The sample containers were kept cool and in darkness and were sent to Jones Environmental Forensics Ltd. for analysis. In order to maintain sample integrity, a chain of custody record (Appendix H) was completed to track sample possession from time of collection to time of analysis.

Surface water samples were analysed for a broad range of potential contaminants. The surface water analytical suite closely followed the parameters as set out in Table C.2 for the EPA Landfill Monitoring Manual (2003) for 'Surface Water Baseline'. The surface water analytical suite for this site included the following parameters:

- indicators and inorganics: sulphate, chloride, fluoride and total cyanide;
- ammonia;
- TON;
- MRP;
- metals including arsenic, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, zinc, calcium, magnesium, potassium and sodium;
- VOCs including BTEX and dichloromethane;
- SVOCs including PAHs, phenols and phthalates;
- VOCs TICs and sVOCs TICs;
- pesticides: atrazine and simazine;
- total dissolved solids;
- alkalinity as CaCO<sub>3</sub>;
- total organic carbon (TOC); and
- BOD and COD.

#### 4.6.5 Landfill Gas Monitoring

A comprehensive regime of landfill gas monitoring was completed on site. Landfill gas was monitored on 21No. occasions between 29<sup>th</sup> June 2009 and the 25<sup>th</sup> June 2010 at BH1 to BH11, BH13 and BH14, and on 10No. occasions at BH20 to BH25 between the 1<sup>st</sup> March 2010 and the 25<sup>th</sup> June 2010. Readings were collected using a GasData LMSXi landfill gas meter from the 29<sup>th</sup> June 2009 to the 15<sup>th</sup> of July 2009, and all subsequent readings were taken using a Geotech GA2000 gas analyser. Relevant daily tidal information for Sligo Harbour was obtained for each landfill gas monitoring event. The landfill gas monitoring locations are shown on Drawing 19.

The following parameters were recorded during each monitoring event:

- Stable and peak methane;
- Carbon dioxide;
- Oxygen;
- Hydrogen sulphide;
- Carbon monoxide;
- Barometric pressure;
- Relative pressure;
- Nitrogen (29<sup>th</sup> June 2009 – 15<sup>th</sup> July 2009);
- Balance of gases (since 16<sup>th</sup> July 2009);
- Residual nitrogen (since 16<sup>th</sup> July 2009); and
- Flow (since 16<sup>th</sup> July 2009).

In addition a separate exercise involving continuous sampling at each gas location for a 15min period as well as monitoring one gas well (BH8) for a 9 hour period was also completed (refer Appendix I).

#### 4.6.6 Internal Landfill Gas Survey

Following the completion of a number of landfill gas monitoring events within the permanently installed wells it was determined that internal gas surveys were required at adjacent properties to confirm that there was no immediate risk to these receptors. Internal landfill gas surveys at a number of properties adjacent to the former landfill were completed on three occasions (19<sup>th</sup> to the 21<sup>st</sup> January 2010, 16<sup>th</sup> to the 18<sup>th</sup> June 2010 and 19<sup>th</sup> to the 21<sup>st</sup> June 2010). All surveys were completed by experienced MOR Environmental Consultants. The properties surveyed are shown on Drawing 20.

In order to ensure that a comprehensive survey was undertaken in accordance with all best practice guidelines, two types of landfill gas detectors were used to measure gas concentrations during the survey; a GA2000 landfill gas analyser and a Photovac MicroFID (an intrinsically safe flame ionisation detector (FID)). The GA2000 landfill gas analyser measures methane, carbon dioxide, oxygen, carbon monoxide, and hydrogen sulphide concentrations and has data logging capabilities. The MicroFID, measures VOCs equivalent to methane in parts per million (ppm) and is a much more sensitive meter when compared to the landfill gas meter which measures only in terms of percentages (% v/v). It functions by measuring the increase in ions produced when organic matter within the gas which it is sampling (i.e. methane) passes through a hydrogen flame (CIRIA C665, 2007). It is specifically recommended in CIRIA C665 (2007) that an FID is used when completing internal gas surveys. Both meters were operated by experienced MOR Environmental Consultants in order to provide an accurate measurement of landfill gas concentrations at that particular time.

Ambient readings were taken in each surveyed room. In addition, particular attention was paid to the following features as these are key areas for landfill gas entry and/or accumulation:

- Around skirting boards;
- Any cracks in the floor;
- Confined spaces including cupboards;
- Service entries;
- Under manhole covers;
- Drains; and
- Pipes entering rooms through the floor or wall.

The surveys focused on kitchen and bathrooms within these properties as these rooms contain the majority of pipes and landfill gas entry points. However, a representative number of rooms were surveyed in each property (access permitting).

For the purpose of the assessment, a representative sample of fourteen properties were surveyed (refer Drawing No. 20). One unit, Duncan's Island, is subdivided into smaller sub-units, three of which were surveyed. The drains and manholes external to the units at Duncan's Island were also surveyed. The following properties were surveyed on three occasions:

- Gray's Joinery;
- Tamwell's Diesel;
- Euroflow (Rocket Fuels);
- Maryville;
- Cosy Stoves, Taurus Metal Products and Senator Windows at Duncan's Island;

- Shalomar;
- Calor Gas;
- Ms. Jean Dolan's house;
- Hunter's Coals;
- Erin Recyclers;
- Sligo Fuels;
- Celtic Anglian Water Ltd;
- Cold Chon; and
- Greenstar.

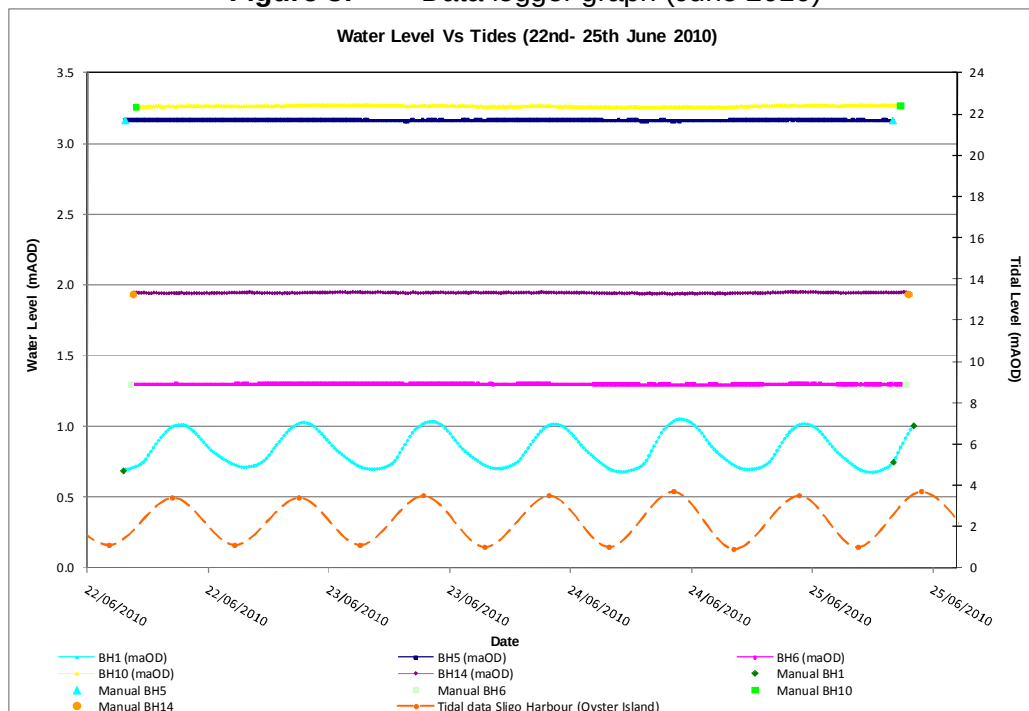
## 5.0 RESULTS

### 5.1 Groundwater Levels

#### 5.1.1 Datalogger Results

The datalogger results indicate a close correlation between tidal data and groundwater fluctuations in groundwater monitoring well BH1, however the tides had no impact on the water levels in the leachate wells installed onsite. Please see Figure 3 for a plot of water level data in 5No. boreholes collected in 2010. Data from 2009 is included in Appendix J for information purposes.

**Figure 3:** Data logger graph (June 2010)



#### 5.1.2 Inferred Groundwater Flow Direction

Groundwater contour diagrams (see Drawing No. 21) indicate that groundwater flow was towards the south west at high tide (water levels recorded on 29<sup>th</sup> June 2009) with inferred flow towards the northwest and northeast at low tide (water levels recorded on the 7<sup>th</sup> July 2009).

## 5.2 Visual and Olfactory Observations

### 5.2.1 Surface

Surface contamination was observed within the former landfill in the form of small amounts of flytipped waste at the site entrance, some metal including a rusted barrel, some slabs of concrete and trace amounts of rebar, plastic and timber. No evidence of surface contamination was observed at any of the surrounding properties (refer photographs 1 – 12).

### 5.2.2 Sub-Surface Material

The soil profile encountered within the former landfill at Finisklin during investigative works consisted of made ground generally comprising of reworked clay/silt or sand/gravel with trace waste including brick, concrete, plastic, fabric and timber overlying municipal waste.

The municipal waste encountered generally consisted of demolition waste (C&D), domestic waste, commercial and industrial waste including ashy material, rubber, plastic, refuse sacks, food wrappers, newspapers, glass, metal, paper, sanitary waste, tyres, bricks and oil

containers (Refer to photographs 13 – 25). Waste was encountered at all locations within the former landfill boundary. The maximum depth observed was 6.0 meters below ground level (mbGL) (BH3).

Natural soil encountered beneath the made ground comprised of firm to stiff clay/silt with varying sand and gravel content; localised lenses of sand/gravel with cobbles were generally associated with the top of weathered bedrock. Bedrock was encountered at depths ranging from 7.2mbGL (BH3) to 10.7mbGL (BH4) and generally comprised of limestone.

The soil profile encountered off-site consisted of made ground generally comprising of reworked clay/silt or sand/gravel with trace waste (with the exception of BH20, where no evidence of waste was found), overlying native silt, sand or gravel. Waste identified included plastic, timber, fabric, brick, metal, and glass.

The subsurface conditions both on and off-site were generally dry to damp. Perched water was encountered as minor seepages/saturated material at discrete locations within the former landfill.

Visual and olfactory evidence of contamination including iridescence/sheen and odour was observed in boreholes BH14, BH15, BH18 and BH22 and BH23, and during the excavation of trial pits TP1, TP6, TP7, TP10, TP13, TP18 and TP21. A 'waste' odour was also frequently encountered during drilling of the probeholes and excavation of the trial pits and during drilling of BH22 and BH23. Hydrocarbon odours were specifically identified in boreholes BH14, BH15, BH22 and BH23 as well as in trial pits TP13, TP17 and TP21.

Appendix K contains a copy of the schematic cross sections for the site.

#### 5.2.3 Vertical Extent of Waste

The maximum vertical extent of waste observed was 6.0 mbGL.

The landfill cap ranged in thickness from 0.1m to 3.6m.

#### 5.2.4 Horizontal Extent of Waste

The northern boundary of former landfill is clearly distinguishable from visual inspection and forms the boundary with the existing mudflats and the WWTW. The boundary between the former landfill and the WWTW was confirmed during the installation of BH20. The western boundary is delineated by Finisklin Road and this has been confirmed by the installation of BH24 and BH25.

The southern and eastern boundaries are more difficult to identify due to the fact that there is waste beyond these site boundaries (Refer to Section 2.1.1 and Appendix A for further detail). A number of borehole were installed beyond the site boundary in these areas including BH16 – BH19 and BH21 – BH22 and the majority of these confirmed the presence of municipal waste or fill at these locations.

#### 5.2.5 Volume of Waste

Volumetric calculations of waste were completed using measurements of the thickness of waste from the investigation locations on site. Based on conservative calculations, the quantity of waste material within the former landfill is estimated to be approximately 625,000t. A conversion factor of 1.4 was used to convert from cubic meters to tonnes.

The quantity of capping material brought onto the landfill is estimated to be approximately 250,000t based on a conversion factor of 1.5 (Waste Management (Landfill Levy) Regulations, 2008).

### 5.3 Landfill Material, Groundwater, Leachate and Surface Water Analytical Results

#### 5.3.1 Landfill Material Analytical Results

Analytical results were assessed relative to the Criteria for landfills outlined in the document 'Establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (2003/33/EC)'. The criteria used were as follows:

- Criteria for landfills for inert waste.
- Criteria for landfills for non-hazardous waste.
- Criteria for landfills for hazardous waste.

Analytical results together with the relevant waste assessment criteria (WAC) are presented in Table 8.

#### TOC

Reported concentrations of TOC ranged from 2.1% (TP10) to 11.1% (TP5) and 3No. samples exceeded the WAC for landfills for Inert, non-hazardous waste and for hazardous waste values of 3%, 5% and 6% respectively including samples for TP3 2.5-3.0m (4.2%), TP5 4.2m (11.1%), TP7 3.5-3.9m (9.4%) and TP16 3.0-4.0m (8.8%).

#### Petroleum Hydrocarbons

##### DRO/EPH/Mineral Oil

Reported concentrations of DRO/EPH (C8-C40) ranged from 799mg/kg (TP16) to 2,345mg/kg (TP5) and the DRO/EPH interpretation indicated naturally occurring products for all samples. Mineral oil concentrations were reported as below the laboratory method detection limit (MDL) (30mg/kg) for all samples and did not exceed the relevant WAC for inert landfills (500mg/kg).

##### MTBE

Concentrations of MTBE did not exceed the laboratory MDL of 0.004mg/kg.

##### BTEX

Benzene concentrations were below the relevant laboratory MDL (0.002mg/kg) for all samples except TP10 (0.008mg/kg). Reported results for toluene above the laboratory MDL ranged from 0.004mg/kg (TP5) to 0.278mg/kg (TP10). Concentrations of ethylbenzene above the laboratory MDL varied from 0.003mg/kg (TP7) to 0.02mg/kg (TP10). Concentrations of m/p xylene above the relevant MDL ranged from 0.012mg/kg (TP7) to 0.191mg/kg (TP10). Concentrations of o-xylene above the MDL varied from 0.003mg/kg (TP7) to 0.118mg/kg (TP10). Total xylene concentrations above the laboratory MDL ranged from 0.015mg/kg (TP7) to 0.309mg/kg (TP10). Reported results for total BTEX above the laboratory MDL varied from 0.018mg/kg (TP7) to 0.070mg/kg (TP3) and did not exceed the relevant WAC for inert landfills of 6mg/kg.

#### Polycyclic Aromatic Hydrocarbons (PAHs)

Detectable concentrations of Total 10 Dutch PAHs<sup>1</sup> were reported ranging from 1.07mg/kg (TP16) to 3.37mg/kg (TP5). Total 17 PAHs ranged from 1.29mg/kg (TP5) to 4mg/kg (TP7). WAC for PAHs have not been identified in the Council Directive which permit member states to identify their own PAH WAC. Typical WAC for PAHs include 100mg/kg for the Murphy Inert facility and 40mg/kg at the Greenstar facility in Kilcullen. None of the results exceeded either of those WAC.

<sup>1</sup> (anthracene, benzo(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, phenanthrene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene and benzo(ghi)perylene)

#### Polychlorinated Biphenyls (PCBs)

Reported concentrations of PCBs were below the MDL for all samples except for the sample taken at TP10, which reported a concentration of 0.082mg/kg. This did not exceed the WAC for inert landfills of 1mg/kg.

#### Gasoline Range Organics (GRO)

GRO (C4-8) concentrations above the MDL (0.1mg/kg) ranged from 0.116mg/kg (TP16) to 1.282mg/kg (TP10). GRO (C8-12) concentrations varied from 0.364mg/kg (TP16) to 46.659mg/kg (TP10), while GRO (C4-12) concentrations ranged from 0.481mg/kg (TP16) to 47.941mg/kg (TP10). There are no WAC for GRO.

#### Soil Leachate (CEN 10:1)

##### Metals

##### Arsenic

Arsenic concentrations ranged from 0.04mg/kg (TP3 and TP7) to 0.08mg/kg (TP16) and did not exceed the WAC.

##### Barium

Barium concentrations ranged from 0.25mg/kg (TP10) to 1.23mg/kg (TP7) and did not exceed the WAC.

##### Cadmium

Cadmium concentrations did not exceed the laboratory MDL (0.01mg/kg) or the WAC.

##### Chromium

Chromium concentrations did not exceed the laboratory MDL of 0.02mg/kg with the exception of the sample from TP3 (0.03mg/kg). However, this did not exceed the WAC.

##### Copper

Copper concentrations were below the laboratory MDL (0.12mg/kg) for all samples and did not exceed the WAC.

##### Mercury

Concentrations of mercury were reported as being below the laboratory MDL (1µg/kg) for all samples and did not exceed the WAC.

##### Molybdenum

Molybdenum concentrations ranged from 0.17mg/kg (TP10) to 0.56mg/kg (TP5) and 2No. samples exceeded the WAC for inert landfills of 0.5mg/kg at TP5 (0.56mg/kg) and TP7 (0.51mg/kg), although all samples complied with the non-hazardous WAC

##### Nickel

Nickel concentrations in excess of the laboratory MDL (0.06mg/kg) were reported in 3No. samples; TP3 (0.13mg/kg), TP5 (0.09mg/kg) and TP10 (0.06mg/kg), but did not exceed the WAC.

##### Lead

Lead concentrations were below the laboratory MDL (0.1mg/kg) for all samples and did not exceed the WAC.

##### Antimony

Antimony concentrations were below the laboratory MDL (0.03mg/kg) for all samples except one at TP5 (0.03mg/kg) and did not exceed the WAC.

#### *Selenium*

Selenium concentrations were below the laboratory MDL (0.03mg/kg) and the WAC.

#### *Zinc*

Zinc concentrations were below the laboratory MDL for all samples except TP10 (0.12mg/kg), and did not exceed the WAC.

#### Indicators and inorganics

##### *Sulphate, Chloride and Fluoride*

Sulphate was detected at concentrations ranging from 102mg/kg (TP5) to 4,501mg/kg (TP10) and 1No. sample exceeded the WAC for inert landfills of 1,000mg/kg at TP10 (4,501mg/kg).

Chloride concentrations ranged from 27mg/kg (TP5) to 498mg/kg (TP10) and did not exceed the WAC.

Fluoride concentrations were not detected above the laboratory MDL (1mg/kg) or the WAC.

##### *Dissolved Organic Carbon (DOC)*

DOC concentrations varied from 20mg/kg (TP16) to 50mg/kg (TP5) and did not exceed the WAC.

##### *Total Dissolved Solids (DTS)*

TDS concentrations ranged from 1,540mg/kg (TP16) to 8,410mg/kg (TP3) and exceeded the WAC for inert landfills of 4,000mg/kg at TP3 (8,410mg/kg) but did not exceed the WAC for non-hazardous landfills.

#### Phenols

Phenol was not detected above the laboratory MDL (1mg/kg) and did not exceed the WAC.

#### *5.3.2 Groundwater Analytical Results*

Groundwater results were assessed relative to available Irish guideline and legislative standards as follows:

- European Communities Environmental Objectives (Groundwater) Regulations, 2010. (SI No. 9 of 2010).
- In the absence of Environmental Objectives for certain parameters, the Environmental Protection Agency (EPA) interim groundwater guideline values (IGVs) (EPA, 2003) were used.

Groundwater analytical results together with the relevant assessment criteria are presented in Table 9.

#### Indicators

##### *Field Indicators*

Field measured parameters such as pH, EC, DO, temperature, TDS, NaCl and ORP were measured onsite. EC values measured ranged from 822µS/cm (BH1) to 5,410µS/cm (BH3) and all samples exceeded the guideline value of 800/1,875µg/l for the groundwater quality. However this is expected given that the site was formerly part of the harbour and strongly influenced by the sea. Temperature readings varied from 11.9°C (BH1) to 14.1°C (BH4) and were within the relevant guideline value of 25°C. pH values ranged from 6.78 pH units (BH1) to 7.47 pH units (BH1) and were also within the relevant guideline range of 6.5-9.5 pH units. TDS readings varied from 411ppm (BH1) to 2,710ppm (BH3). A number of measurements



exceeded the relevant EPA interim guideline value (IGV) of 1,000ppm including samples from BH2 and BH3.

There are no guideline values for DO, NaCl or ORP. DO concentrations measured on site ranged from 4% (BH3) to 55.7% (BH1). NaCl concentrations varied from 1.4% (BH1) to 10.1% (BH3). ORP measured ranged from a negative ORP of -133mV (BH2) to a positive ORP of 111mV (BH4). A negative ORP is indicative of reducing conditions while a positive ORP is indicative of oxidising conditions.

#### Indicators and inorganics

Sulphate was detected at concentrations ranging from 0.09mg/l (BH3) to 94.71mg/l (BH2) and did not exceed the relevant guideline values.

Chloride concentrations ranged from 40.5mg/l (BH1) to 788.80mg/l (BH3) and all samples exceeded the relevant groundwater objectives threshold values (24/187.5mg/l). 4No. samples exceeded the relevant drinking water standard of 250mg/l including samples from BH2 (469.7mg/l and 457.1mg/l) and BH3 (777.30mg/l and 788.80mg/l). However this is expected given that the site was formerly part of the harbour and strongly influenced by the sea.

Fluoride concentrations above the laboratory method MDL ranged from 0.40mg/l (BH2) to 0.60mg/l (BH3) and did not exceed the relevant guideline values.

Ammonia concentrations above the laboratory MDL (0.1mg/l) ranged from 0.4mg/l (BH1) to 75.90mg/l (BH3) and 7No. samples exceeded the relevant groundwater quality objectives threshold values of 0.065/0.175mg/l including samples from BH1 (0.4mg/l), BH2 (1.6mg/l and 22.1mg/l), BH3 (15.0mg/l and 75.9mg/l) and BH4 (5.5mg/l and 31.1mg/l).

Total oxidised nitrogen was detected above the laboratory MDL (0.05mg/l) in 3No. samples, with concentrations ranging from 0.06mg/l (BH4) to 0.43mg/l (BH1). There are no threshold values for total oxidised nitrogen.

MRP concentrations ranged from 7µg/l (BH1) to 405µg/l (BH3) and 5No. samples exceeded the relevant groundwater quality objectives threshold value of 35µg/l including samples from BH1 (57µg/l), BH2 (290µg/l), BH3 (84µg/l and 405µg/l) and BH4 (330µg/l).

TDS concentrations ranged from 407mg/l (BH1) to 2,871mg/l (BH3) and 5No. samples exceeded the relevant EPA IGV of 1,000mg/l including samples from BH2 (1,531mg/l and 1,571mg/l), BH3 (2,871mg/l and 2,745mg/l) and BH4 (1,690mg/l).

Total alkalinity concentrations ranged from 268mg/l (BH1) to 1,920mg/l (BH3). There are no threshold values for total alkalinity.

Concentrations of TOC below the laboratory MDL were reported for all samples with the exception of BH3 (12mg/l). There are no threshold values for TOC.

Total cyanide was not detected above the laboratory MDL (40µg/l); however the MDL is higher than the relevant groundwater quality objectives value of 37.5µg/l.

#### Microbiological parameters

Total coliforms were detected at a concentration of >1,000cfu/100ml for all samples, all of which exceeded the relevant EPA IGV of 0cfu/100ml.

Faecal coliforms were detected at a concentration of >1,000cfu/100ml for all samples with the exception of 2No. samples at BH3 and BH4, which reported concentrations of

0cfu/100ml. Therefore, 6No. samples exceeded the relevant EPA IGV of 0cfu/100ml including samples from BH1, BH2, BH3 and BH4.

### Metals

In the absence of groundwater objectives threshold values for total metals, the threshold values for dissolved metals have been used for comparison purposes.

#### *Mercury*

Reported concentrations of total mercury were below the laboratory MDL (1µg/l) and the threshold value for all samples.

#### *Boron*

Total boron concentrations ranged from 42µg/l (BH1) to 2,471µg/l (BH3). 4No. samples exceeded the groundwater objectives threshold values of 750µg/l including samples from BH2 (1,223µg/l and 1,353µg/l) and BH3 (2,279µg/l and 2,471µg/l).

#### *Arsenic*

Total arsenic concentrations in excess of the laboratory MDL ranged from 3.5µg/l (BH2) to 13.5µg/l (BH2) and exceeded the groundwater objectives threshold value of 7.5µg/l at 4No. samples including samples from BH2 (13.5µg/l), BH3 (7.7µg/l and 8µg/l) and BH4 (9.3µg/l).

#### *Zinc*

Total zinc concentrations ranged from 4µg/l (BH1) to 28µg/l (BH2) and did not exceed the relevant guideline value.

#### *Lead*

Reported concentrations of total lead were below the laboratory MDL (5µg/l) for all samples with the exception of one sample from BH4 (5µg/l), but did not exceed the threshold value.

#### *Nickel*

Total nickel concentrations in excess of the laboratory MDL (2µg/l) ranged from 3µg/l (BH1) to 16µg/l (BH3) and exceeded the groundwater objectives threshold value of 15µg/l in 1No. sample at BH3 (16µg/l).

#### *Copper*

Total copper concentrations in excess of the laboratory MDL (7µg/l) ranged from 8µg/l (BH2) to 33µg/l (BH3) and did not exceed the threshold value.

#### *Chromium*

Total chromium concentrations in excess of the laboratory MDL (1.5µg/l) ranged from 1.8µg/l (BH2) to 5.7µg/l (BH4) and did not exceed the threshold value.

#### *Cadmium*

Reported concentrations of total cadmium were below the laboratory MDL (0.5µg/l) for all samples with the exception of one at BH4 (0.7µg/l) and did not exceed the threshold value.

#### *Manganese*

Total manganese concentrations ranged from 17µg/l (BH1) to 617µg/l (BH4) and exceeded the relevant EPA IGV of 50µg/l in 7No. samples, including samples from BH1 (100µg/l), BH2 (278µg/l and 462µg/l), BH3 (131µg/l and 533µg/l) and BH4 (504µg/l and 617µg/l).

#### *Iron*

Total iron concentrations ranged from 31µg/l (BH1) to 21,240µg/l (BH4) and exceeded the relevant EPA IGV of 200µg/l in 4No. samples including samples from BH1 (273µg/l), BH2 (9,278µg/l), BH3 (11,630µg/l) and BH4 (21,240µg/l).

### *Potassium*

Total potassium concentrations ranged from 4.66mg/l (BH1) to 183.2mg/l (BH3) and exceeded the relevant EPA IGV value of 5mg/l in 7No. samples including samples from BH1 (5.40mg/l), BH2 (58.11mg/l and 44.53mg/l), BH3 (183.2mg/l and 119.1mg/l) and BH4 (30.58mg/l and 23.55mg/l).

### *Sodium*

Total sodium concentrations ranged from 31.66mg/l (BH1) to 756.4mg/l (BH3). 4No. samples exceeded the relevant groundwater quality objective threshold value of 150mg/l including samples from BH2 (477.80mg/l and 388mg/l) and BH3 (756.4mg/l and 633.4mg/l).

### *Calcium*

Total calcium concentrations ranged from 41.78mg/l (BH3) to 144.7mg/l (BH4) and did not exceed the relevant guideline value.

### *Magnesium*

Total magnesium concentrations ranged from 10.83mg/l (BH1) to 136.2mg/l (BH3) and exceeded the relevant IGV of 50mg/l in 3No. samples including samples from BH2 (60.14mg/l) and BH3 (136.2mg/l and 101.6mg/l).

### Pesticides

Reported concentrations of atrazine and simazine were below the laboratory MDL (1µg/l for both parameters) for all samples; however please note that the laboratory MDL is higher than the groundwater objectives threshold value of 0.075µg/l.

### sVOCs

Reported concentrations of sVOCs were below the relevant laboratory MDLs and relevant guideline values for all parameters. No sVOC TICs were reported.

### VOCs

Reported concentrations of VOCs were below the relevant laboratory MDLs and relevant guideline values for all parameters. No VOC TICs were reported.

### *5.3.3 Groundwater as a Drinking Water Resource*

Groundwater results were also compared against Drinking Water Standards (Irish Drinking Water Standards (SI No. 278 of 2007)). All of the parameters were in compliance with the limits set out in the Drinking Water Regulations with the exception of EC, chloride, boron and sodium in BH2 and BH3, ammonia, manganese and iron in all locations and arsenic in one sample from BH2. Saline intrusion was clearly identified and therefore the bedrock aquifer as a drinking water receptor will not be assessed further.

### *5.3.4 Leachate Analytical Results*

Leachate results were tabulated against published minimum and maximum observed ranges for acetogenic and methanogenic leachates (EPA (2000) Landfill Manuals, Landfill Site Design). These standards were used for guideline purposes only.

Leachate results together with the relevant assessment criteria are presented in Table 10.

### Indicators

#### *Field Indicators*

Similar to the groundwater samples, field measured parameters such as pH, EC, DO, temperature, TDS, NaCl and ORP were measured onsite. EC values measured ranged from 591µS/cm (BH11) to 2,726µS/cm (BH13). Temperature readings varied from 12.8°C (BH6) to 16.3°C (BH11). pH values ranged from 6.82 pH units (BH14) to 9.96 pH units (BH13). TDS readings ranged from 295ppm (BH11) to 1,364ppm (BH13).

DO concentrations measured in leachate ranged from 5.1% (BH10) to 30.1% (BH11). NaCl concentrations varied from 1% to 5.2%. ORP readings ranged from a negative ORP of -141mV (BH13) to a positive ORP of 136mV (BH10).

#### Indicators and inorganics

Sulphate was detected at concentrations ranging from 1.05mg/l (BH14) to 114.91mg/l (BH6).

Chloride concentrations ranged from 14.40mg/l (BH11) to 101.90mg/l (BH6).

Reported concentrations of fluoride and total cyanide were below the laboratory MDL for all samples.

Ammonia concentrations ranged from 0.10mg/l (BH14) to 62.40mg/l (BH6).

Total oxidised nitrogen was detected above the laboratory MDL (0.05mg/l) in 2No. samples, both from BH11 (0.18mg/l and 0.31mg/l).

MRP concentrations ranged from 29µg/l (BH14) to 1,032µg/l (BH14).

BOD concentrations ranged from 6mg/l (BH11) to 125.5mg/l (BH6).

COD concentrations ranged from 14mg/l (BH11) to 2,670mg/l (BH6).

#### Metals

##### Mercury

Reported concentrations of total mercury were below the laboratory MDL (1µg/l) for all samples.

##### Boron

Total boron concentrations in excess of the laboratory MDL ranged from 77µg/l (BH14) to 480µg/l (BH6).

##### Arsenic

Total arsenic concentrations in excess of the laboratory MDL ranged from 2.9µg/l (BH11) to 30.0µg/l (BH14).

##### Zinc

Total zinc concentrations ranged from 4µg/l (BH14) to 362µg/l (BH6).

##### Lead

Total lead concentrations ranged from 5µg/l (BH14) to 84µg/l (BH6).

##### Nickel

Total nickel concentrations in excess of the laboratory MDL (2µg/l) ranged from 4µg/l (BH11 and BH14) to 26µg/l (BH6).

##### Copper

Total copper concentrations in excess of the laboratory MDL (7µg/l) ranged from 8µg/l (BH11) to 43µg/l (BH6).

##### Chromium

Total chromium concentrations in excess of the laboratory MDL (1.5µg/l) ranged from 2.7µg/l (BH6) to 36.3µg/l (BH14).

#### *Cadmium*

Total cadmium was detected above the laboratory MDL (0.5µg/l) in 2No. samples including samples from BH6 (1.6µg/l) and BH14 (6.3µg/l).

#### *Manganese*

Total manganese concentrations ranged from 344µg/l (BH11) to 1,754µg/l (BH6).

#### *Iron*

Total iron concentrations ranged from 239µg/l (BH11) to 129,500µg/l (BH14).

#### *Potassium*

Total potassium concentrations ranged from 2.33mg/l (BH11) to 66.09mg/l (BH6).

#### *Sodium*

Total sodium concentrations ranged from 10.24mg/l (BH11) to 113.50mg/l (BH6).

#### *Calcium*

Total calcium concentrations ranged from 108.00mg/l (BH11) to 267.50mg/l (BH6).

#### *Magnesium*

Total magnesium concentrations ranged from 7.28mg/l (BH11) to 71.40mg/l (BH6).

#### Pesticides

Reported concentrations of atrazine and simazine were below the laboratory MDL (1µg/l for both parameters) for all samples.

#### sVOCs

Reported concentrations of sVOCs were below the relevant laboratory MDLs for all parameters. No sVOC TICs were reported.

#### VOCs

Reported concentrations of VOCs were below the relevant laboratory MDLs for all parameters. No VOC TICs were reported.

#### *Typical Acetogenic and Methanogenic Values*

The majority of reported concentrations were below the reported minimum acetogenic leachate values for relevant parameters, with the exception of some values of pH, sulphate, mercury, arsenic, zinc, lead, copper, chromium, manganese, iron and magnesium for which some or all sample concentrations fell within the expected range. The case was similar for methanogenic leachate guideline values, for which some concentrations were within the recommended range for pH, sulphate, BOD, COD arsenic, zinc, lead, copper, chromium, manganese, iron, calcium and manganese. In the case of mercury, the MDL (<1µg/l) was greater than the maximum methanogenic leachate guideline value of 0.8µg/l. One pH value at BH13 (9.96 pH units) exceeded the maximum reported value for both acetogenic and methanogenic leachates.

#### *5.3.5 Surface Water Analytical Results*

The surface water results were assessed relative to the Irish Surface Water Standards (SI No. 272 of 2009). Surface water analytical results together with relevant assessment criteria are presented in Table 11. A summary of the results is presented below.

#### *Field indicators*

Field measured parameters including pH, EC, DO, temperature, TDS, NaCl and ORP were measured onsite.

#### *pH*

pH results ranged from 7.04 pH units in SW2 to 9.79 pH units in SW3. There are no guideline values for pH.

#### *EC*

EC concentrations ranged from 429µS/cm (SW4) to 19,490µS/cm (SW2). There are no guideline values for EC.

#### *Temperature*

Temperature readings varied from 15.8°C in SW2 to 22.8°C in SW3.

#### *DO*

DO concentrations ranged from 19.2% in SW2 to 104.9% in SW3. Two of the four samples (SW1 and SW2) failed to meet the lower limit (>70% (0psu) and >80% DO (35psu)) of the relevant standard.

#### *TDS*

TDS readings varied from 215ppm (SW4) to 10,110ppm (SW2). There are no guideline values for TDS.

#### *NaCl*

NaCl concentrations ranged from 0.7% (SW4) to 38.9% (SW2). There are no guideline values for sodium chloride.

#### *ORP*

Measurements ranged from -44mV in SW1 to 122mV in SW2. There are no guideline values for ORP.

#### *Indicators and inorganics*

Sulphate was detected at concentrations ranging from 17.04mg/l (SW4) to 822.62mg/l (SW2). There are no guideline values for sulphate.

Chloride concentrations ranged from 17.4mg/l (SW4) to 6,876.8mg/l (SW2). There are no guideline values for chloride.

Fluoride concentrations above the laboratory MDL ranged from 0.3mg/l (SW3) to 5.7mg/l (SW1). 1No. sample exceeded the relevant surface water regulation annual mean value of 1.5mg/l at SW1 (5.7mg/l).

Ammonia concentrations ranged from 0.3mg/l (SW3 and SW4) to 82.1mg/l (SW1). There are no guideline values for ammonia.

Total oxidised nitrogen was not detected above the laboratory MDL (0.05mg/l). There are no guideline values for total oxidised nitrogen.

MRP concentrations ranged from 28µg/l (SW3) to 412µg/l (SW2) and 3No. samples exceeded the relevant surface water regulations annual mean value of ≤40µg/l (35psu) including samples from SW1 (135µg/l), SW2 (412µg/l) and SW4 (59µg/l), and the samples from SW1 and SW2 also exceeded the annual mean value of ≤60µg/l (0-17psu).

TDS concentrations ranged from 277mg/l (SW3) to 12,692mg/l (SW1). There are no guideline values for total dissolved solids.

Total suspended solids concentrations exceeded the laboratory MDL in 2No. samples at SW1 (148mg/l) and SW2 (158mg/l). There are no guideline values for total suspended solids.

Total alkalinity concentrations ranged from 33.2mg/l (SW3) to 848mg/l (SW1). There are no guideline values for total alkalinity.

TOC concentrations above the laboratory MDL were reported for 2No. samples including samples at SW3 (3mg/l) and SW4 (19mg/l). There are no guideline values for TOC.

Total cyanide was not detected above the laboratory MDL (40µg/l). However the MDL is greater than the surface water regulations annual mean value of 10µg/l.

COD concentrations ranged from 16mg/l (SW3) to 167mg/l (SW1). There are no guideline values for COD.

BOD concentrations ranged from 5mg/l (SW3) to 14mg/l (SW1) and all samples exceeded the surface water regulations 95<sup>th</sup> percentile value of ≤4mg/l.

### Metals

#### Mercury

Concentrations of total mercury were reported as being below the laboratory MDL (1µg/l) for all samples. The MDL is greater than the surface water regulations annual mean value of 0.05µg/l and maximum allowable concentration (MAC) of 0.07µg/l.

#### Boron

Total boron concentrations ranged from 81µg/l (SW4) to 2,107µg/l (SW1). There are no guideline values for total boron.

#### Arsenic

Total arsenic concentrations did not exceed the laboratory MDL of 2.5µg/l except for one sample at SW4 (3.3µg/l). There are no guideline values for total arsenic.

#### Zinc

Total zinc concentrations ranged from 11µg/l (SW2) to 14µg/l (SW4). There are no guideline values for total zinc.

#### Lead

Total lead concentrations were below the laboratory MDL (5µg/l) for all samples with the exception of SW4 (5µg/l) which did not exceed the relevant guideline value.

#### Nickel

Total nickel concentrations in excess of the laboratory MDL (2µg/l) were reported in 2No. samples; SW3 (3µg/l) and SW4 (5µg/l), and did not exceed the relevant guideline value.

#### Copper

Total copper concentrations were below the laboratory MDL (7µg/l) for all samples with the exception of SW3 (8µg/l). There are no guideline values for total copper.

#### Chromium

Total chromium concentrations were below the laboratory MDL (1.5µg/l) for all samples. The MDL was greater than the surface water regulations annual mean value of 0.6µg/l.

#### Cadmium

Total cadmium concentrations were below the laboratory MDL (0.5µg/l) for all samples. The MDL was greater than the surface water regulations annual mean value of 0.2µg/l and maximum allowable concentration (MAC) value of ≤0.45µg/l.

#### *Manganese*

Total manganese concentrations ranged from 8µg/l (SW3) to 343µg/l (SW2). There are no guideline values for total manganese.

#### *Iron*

Total iron concentrations ranged from 60µg/l (SW3) to 1,066µg/l (SW4). There are no guideline values for total iron.

#### *Potassium*

Total potassium concentrations ranged from 6.98mg/l (SW4) to 306mg/l (SW2). There are no guideline values for total potassium.

#### *Sodium*

Total sodium concentrations ranged from 10.53mg/l (SW4) to 2,188µg/l (SW2). There are no guideline values for total sodium.

#### *Calcium*

Total calcium concentrations ranged from 60.21mg/l (SW4) to 226mg/l (SW2). There are no guideline values for total calcium.

#### *Magnesium*

Total magnesium concentrations ranged from 3.6mg/l (SW4) to 179mg/l (SW1). There are no guideline values for total magnesium.

#### Pesticides

Reported concentrations of atrazine and simazine were below the laboratory MDL (1µg/l for both parameters) for all samples. However, the MDL for atrazine was greater than the surface water regulations annual mean value of 0.6µg/l.

#### sVOCs

Reported concentrations of sVOCs were below the relevant laboratory MDLs for all parameters. No sVOC TICs were reported.

#### VOCs

Reported concentrations of VOCs were below the relevant laboratory MDLs for all parameters. No VOC TICs were reported.

#### Organotin Compounds

Reported concentrations of organotin compounds were below the relevant laboratory MDLs for all parameters.

### **5.4 Geotechnical Results**

Two samples were collected from the capping layer in June 2010 (see Drawing No. 19 for sampling locations). These were sent to Ground Investigations Ireland for geotechnical analysis. Geotechnical sample 1 was reported as being light brown slightly sandy gravelly clay with some cobbles. Geotechnical sample 2 was reported as being light brown slightly sandy gravelly silty clay with some cobbles.

In addition to a sample description, the samples were also tested for Particle Size Distribution (PSD) in accordance with BS 1377: 1990: Part 2: Clauses 9.2 & 9.5. The results of this test are presented in Table 12.



**Table 12:** Geotechnical Results (PSD)

| Sample | Clay (%) | Silt (%) | Sand (%) | Gravel (%) | Cobbles (%) | Boulders (%) |
|--------|----------|----------|----------|------------|-------------|--------------|
| 1      | 0        | 24.7     | 18.2     | 36.4       | 20.8        | 0            |
| 2      | 0        | 27.3     | 16.6     | 35.4       | 20.7        | 0            |

## 5.5 Landfill Gas Monitoring Results

### 5.5.1 Landfill Gas Monitoring (2009-2010)

An extensive gas monitoring survey was completed at all of the permanently installed gas monitoring wells. In addition to the gas wells, four of the groundwater monitoring wells were installed within the response zone in the underlying bedrock of the Glencar formation (BH1 to BH4) and were also fitted with gas caps. In addition to samples collected within the boundary of the former landfill gas monitoring has been carried out by MOR in newly installed wells located outside the former landfill boundary (Refer to Drawing No. 19 for gas and groundwater monitoring well locations and Drawing No. 22 for results).

Methane and carbon dioxide results (concentrations expressed as a percentage in volume (% v/v)) were assessed relative to the EPA 1997 threshold values outlined in the document 'Landfill Manuals – Landfill Operational Practices' (EPA, 1997) and the Department of the Environment exposure limits (1994). There are no threshold values or DOE exposure limits for hydrogen sulphide or carbon monoxide. Gas monitoring results together with the relevant assessment criteria are presented in Table 13 and displayed on Drawing 22.

#### BH1

Stable methane concentrations ranged from 0% v/v to 7.3% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively during 1No. monitoring event (21/01/10). Carbon dioxide concentrations ranged from 0% v/v to 4.4% v/v and exceeded the threshold value of 1.5% v/v during 1No. monitoring event (21/01/10) and the exposure limit of 0.5% v/v on 3No. occasions ((18/09/09, 07/10/09 and 21/01/10). Hydrogen sulphide was not detected at this location. Carbon monoxide was detected on 1No. occasion (23/04/10) at a concentration of 2ppm.

#### BH2

Stable methane concentrations ranged from 0% v/v to 0.3% v/v and did not exceed the threshold value or exposure limit. Carbon dioxide concentrations ranged from 0% v/v to 1.0% v/v and exceeded the exposure limit on one occasion (25/06/10). Hydrogen sulphide was detected on 1No. occasion at a concentration of 1ppm (23/04/10). Carbon monoxide concentrations ranged from 0ppm to 7ppm.

#### BH3

Stable methane concentrations ranged from 0% v/v to 3.4% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively on 3No. occasions (16/06/10, 18/06/10 and 22/06/10). Carbon dioxide concentrations ranged from 0% v/v to 1.0% v/v and exceeded the exposure limit on three occasions (16/06/10, 18/06/10 and 22/06/10). Hydrogen sulphide was detected at a concentration of 1ppm on two occasions (29/06/10 and 23/04/10). Carbon monoxide was detected on one occasion (23/04/10) at a concentration of 2ppm.

#### BH4

Stable methane concentrations ranged from 0% v/v to 4.7% v/v and exceeded the threshold value and exposure limits of 1.0% v/v and 0.5% v/v, on 7No. occasions for the threshold value and on 10No. occasions the exposure limit. Carbon dioxide concentrations ranged from 0% v/v to 2.4% v/v and exceeded the threshold value of 1.5% v/v and the exposure limit

on an additional 3No. occasions. Hydrogen sulphide was never detected at this location. Carbon monoxide was detected on 2No. occasions (29/06/09 and 23/04/10) at concentrations of 1ppm and 2ppm.

#### *BH5*

Stable methane concentrations ranged from 13.0% v/v to 69.6% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively during every monitoring event. Carbon dioxide concentrations ranged from 3.2% v/v to 34.3% v/v and exceeded the threshold value and exposure limit during every monitoring event. Hydrogen sulphide concentrations ranged from 0ppm to 5ppm. Carbon monoxide concentrations ranged from 0ppm to 16ppm.

#### *BH6*

Stable methane concentrations ranged from 0.1% v/v to 80.7% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively during all but 2No. monitoring events for the threshold values and an additional 1No. monitoring event for the exposure limit. Carbon dioxide concentrations ranged from 0% v/v to 14.4% v/v and exceeded the threshold value on 11No. occasions and the exposure limit on an additional 6No. occasions. Hydrogen sulphide was detected on one occasion at a concentration of 1ppm (29/06/10). Carbon monoxide concentrations ranged from 0ppm to 2ppm.

#### *BH7*

Stable methane concentrations ranged from 22.3% v/v to 59.1% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively during every monitoring event. Carbon dioxide concentrations ranged from 14.0% v/v to 24.5% v/v and exceeded the threshold value and exposure limit during every monitoring event. Hydrogen sulphide concentrations ranged from 0ppm to 4ppm. Carbon monoxide concentrations ranged from 0ppm to 17ppm.

#### *BH8*

Stable methane concentrations ranged from 0% v/v to 80.0% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively on all but 2No. occasions. Carbon dioxide concentrations ranged from 0.1% v/v to 24.1% v/v and exceeded the threshold value and exposure limit during all but 2No. monitoring events. Hydrogen sulphide concentrations ranged from 0ppm to 17ppm. Carbon monoxide concentrations ranged from 0ppm to 3ppm.

#### *BH9*

Stable methane concentrations ranged from 0% v/v to 75.3% v/v and exceeded the threshold value and exposure limit of 1.0% v/v and 0.5% v/v, respectively on all but 2No. occasions, and were generally in excess of 54% v/v. Carbon dioxide concentrations ranged from 0.1% v/v to 35.0% v/v and exceeded the threshold value during all but 1No. monitoring events and the exposure limit during an additional 1No. monitoring event. The majority of readings were in excess of 29% v/v carbon dioxide. Hydrogen sulphide concentrations ranged from 0ppm to 13ppm. Carbon monoxide concentrations ranged from 0ppm to 7ppm.

#### *BH10*

Stable methane concentrations ranged from 0% v/v to 0.2% v/v and did not exceed the threshold value or the exposure limit. Carbon dioxide concentrations ranged from 0% v/v to 1.3% v/v, and exceeded the threshold value on 2No. occasions and the exposure limit during an additional 1No. occasion. Hydrogen sulphide was detected on 2No. occasions (29/06/09 and 23/04/10). Carbon monoxide concentrations ranged from 0ppm to 8ppm.

#### *BH11*

Stable methane concentrations ranged from 0% v/v to 0.2% v/v and did not exceed the threshold value or exposure limit. Carbon dioxide concentrations ranged from 0% v/v to 6.4% v/v, and exceeded the threshold value on 5No. occasions and the exposure limit during an additional 4No. monitoring events. Hydrogen sulphide was detected on 1No. occasion (23/04/10). Carbon monoxide was not detected at this location.

#### *BH13*

Stable methane was only detected on one occasion (16/07/09) at a concentration of 0.3% v/v and did not exceed the threshold value or exposure limit. Carbon dioxide concentrations ranged from 3.3% v/v to 11.3% v/v, and exceeded the threshold value and exposure limit during all monitoring events. Hydrogen sulphide was detected on 2No. occasions at a concentration of 1ppm (29/06/09 and 23/04/10). Carbon monoxide was not detected at this location.

#### *BH14*

Stable methane concentrations ranged from 0% v/v to 80.4% v/v and exceeded the threshold value and exposure limit during all but 3No. occasions. The majority of readings were in excess of 36% v/v. Carbon dioxide concentrations ranged from 0.1% v/v to 5.7% v/v, and exceeded the threshold value during all but 3No. occasions and the exposure limit during an additional 1No. occasion. Hydrogen sulphide was not detected at this location. Carbon monoxide concentrations ranged from 0ppm to 4ppm.

#### *BH20*

Stable methane was not detected at this location, although there were 3No. peak values ranging from 0.1% v/v to 0.4% v/v recorded. Carbon dioxide concentrations ranged from 0% v/v to 1.6% v/v, and exceeded the threshold value on 1No. occasion and the exposure limit during an additional 4No. occasions. Hydrogen sulphide was detected on 1No. occasion (23/04/10) at a concentration of 1ppm. Carbon monoxide was detected on 1No. occasion (23/04/10) at a concentration of 3ppm.

#### *BH21*

Stable methane concentrations ranged from 30.9% v/v to 76.0% v/v and exceeded the threshold value and exposure limit during every monitoring event. Carbon dioxide concentrations ranged from 0.7% v/v to 2.9% v/v, and exceeded the threshold value on all but 3No. occasions and exceeded the exposure limit during all monitoring events. Hydrogen sulphide was detected on 2No. occasions (01/03/10 and 23/04/10) at concentrations of 5ppm and 1ppm respectively. Carbon monoxide was detected on 1No. occasion (23/04/10) at a concentration of 3ppm.

#### *BH22*

Stable methane concentrations ranged from 0% v/v to 6.2% v/v and exceeded the threshold value on 3No. occasions and the exposure limit during an additional 2No. monitoring events. Carbon dioxide concentrations ranged from 0% v/v to 10.1% v/v, and exceeded the threshold value on 4No. occasions and the exposure limit during an additional 1No. occasion. Hydrogen sulphide was detected on 1No. occasion (23/04/10) at a concentration of 1ppm. Carbon monoxide was detected on 1No. occasion (23/04/10) at a concentration of 3ppm.

#### *BH23*

Stable methane concentrations ranged from 10.0% v/v to 81.4% v/v and exceeded the threshold value and exposure limit during every monitoring event. Carbon dioxide concentrations ranged from 0.7% v/v to 10.0% v/v, and exceeded the threshold value during all but 2No. occasions and exceeded the exposure limit during all monitoring events. Hydrogen sulphide was detected on 1No. occasion (16/04/10) at a concentration of 1ppm. Carbon monoxide concentrations ranged from 0ppm to 243ppm.

#### BH24

Stable methane concentrations ranged from 0% v/v to 0.1% v/v and did not exceed the threshold value or exposure limit. Carbon dioxide concentrations ranged from 0.1% v/v to 2.7% v/v, and exceeded the threshold value on 6No. occasions and the exposure limit during an additional 2No. occasions. Hydrogen sulphide and carbon monoxide were not detected at this location.

#### BH25

Stable methane concentrations ranged from 0% v/v to 0.1% v/v and did not exceed the threshold value or exposure limit. Carbon dioxide concentrations ranged from 0.1% v/v to 2.3% v/v, and exceeded the threshold value on 2No. occasions and the exposure limit during an additional 3No. monitoring events. Hydrogen sulphide and carbon monoxide were not detected at this location.

#### 5.5.2 Extended Gas Monitoring

Extended gas monitoring (15 minutes per location) was completed at all permanently installed gas monitoring wells (refer Table 14 for results and Appendix L for graphs). Overall three patterns can be observed:

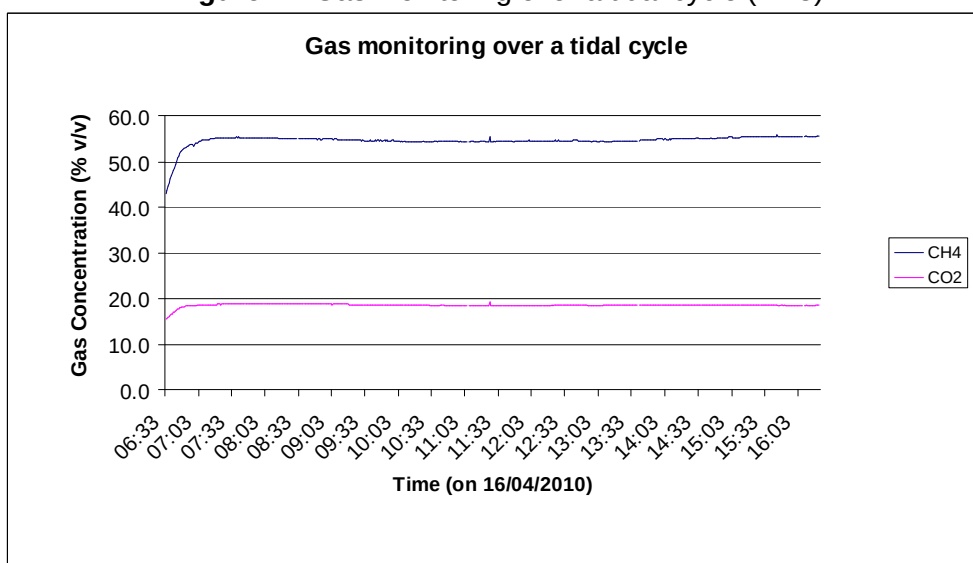
- Concentrations remained low and did not increase – BH1, BH2, BH3, BH10, BH11, BH20, BH22 and BH25.
- Concentrations decreased over time – BH4.
- Concentrations increased over time or stabilised at elevated concentrations – BH5, BH6, BH7, BH8, BH9, BH13, BH14, BH21, BH23 and BH24.

#### 5.5.3 Gas monitoring data over tidal cycle

In addition to routine monitoring landfill gas monitoring was carried at borehole BH8 over a tidal cycle on 16<sup>th</sup> April 2010. The results indicate that the variation in groundwater levels with tide have no significant influence on the concentration of gas recorded in the wells (Figure 4).

During the monitoring atmospheric pressure remained at 1025mb and the tide varied from a high water level of 3.8m at 07:59 to a low water level of 0.6m at 13:34.

**Figure 4:** Gas monitoring over a tidal cycle (BH8)



## 5.6 Internal Gas Monitoring

The locations where the internal gas monitoring was undertaken are shown on Drawing 20 and the results are tabulated in Appendix M.

### *Gray's Joinery*

Elevated concentrations of methane or carbon dioxide were not detected at this location during any of the 3No. monitoring events. During monitoring event No.1 FID readings did not rise above 0ppm; during monitoring event No.2 FID readings ranged from 0.1ppm to 1.9ppm; and during monitoring event No. 3 FID readings ranged from 0ppm to 0.7ppm.

### *Tamwell's Diesel*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings did not rise above 0ppm; during monitoring event No.2 FID readings ranged from 0ppm to 6.7ppm; and during monitoring event No. 3 FID readings ranged from 0ppm to 1.3ppm.

### *Euroflow/Rocket Fuels*

Elevated concentrations of methane or carbon dioxide were not detected at this location, however during monitoring event No.1 carbon dioxide concentrations fluctuated between 0.1% v/v and 0.2% v/v in one of the portacabins. During monitoring event No.1 FID readings did not rise above 0ppm; during monitoring event No.2 FID readings ranged from 0ppm to 0.5ppm; and during monitoring event No. 3 FID readings again did not rise above 0ppm.

### *Maryville*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings ranged from 0ppm to 10.2ppm; during monitoring event No.2 FID readings ranged from 0ppm to 0.4ppm; and during monitoring event No.3 FID readings ranged from 0ppm and 0.7ppm.

### *Duncan's Island*

#### *Cosy Stoves*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings ranged from 0ppm to 9.0ppm; during monitoring event No.2 FID readings ranged from 0ppm to 3.4ppm; and during monitoring event No.3 FID readings ranged from 0ppm and 1.0ppm.

#### *Senator Windows*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings ranged from 0ppm to 2.2ppm; during monitoring event No.2 FID readings ranged from 0ppm to 5.8ppm; and during monitoring event No.3 FID readings ranged from 0ppm and 1.2ppm.

#### *Taurus Metal Products*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings ranged from 0ppm to 4.9ppm; during monitoring event No.2 FID readings ranged from 0ppm to 0.6ppm; and during monitoring event No.3 FID readings ranged from 0ppm and 0.3ppm.

#### *Exterior to shop at Duncan's Island*

During Monitoring Event No.3, 1No. elevated concentration of methane (0.3% v/v) was recorded in a pipe at the back of the buildings. Several elevated concentrations of carbon dioxide were detected, ranging from 0.2% v/v to 0.4% v/v, all located at manholes or pipes. Elevated FID readings ranged from 23ppm to 1207ppm, at 6No. locations, all of which were manholes or pipes.

#### *Shalomar*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings ranged from 0ppm to 0.4ppm; during monitoring event No.2 FID readings ranged from 0ppm to 0.6ppm; and during monitoring event No.3 FID readings ranged from 0ppm to 1.4ppm.

#### *Calor Gas*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings did not rise above 0ppm; during monitoring event No.2 FID readings ranged from 0.2ppm to 1.1ppm; and during monitoring event No.3 FID readings ranged from 0ppm to 0.4ppm.

#### *Hunter's Coals*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1 FID readings ranged from 0ppm to 13.1ppm; during monitoring event No.2 FID readings ranged from 0ppm to 100ppm, with 1No. elevated reading (a peak of 100ppm and a stable reading of 30ppm). This reading was taken from a drain in the yard. During monitoring event No.3 FID readings ranged from 0ppm to 39.1ppm, with several elevated readings, including 25ppm (from a drain in the yard), 24.2ppm and 39.1ppm (both from manholes in the yard).

#### *Erin Recyclers*

Elevated concentrations of methane and carbon dioxide were not detected during monitoring event No. 1, while FID readings ranged from 0ppm to 0.1ppm. Elevated concentrations of methane and carbon dioxide concentrations were detected at this location during monitoring events No. 2 and 3. During monitoring event No.2, elevated methane (0.9% v/v) and carbon dioxide (8.4% v/v) concentrations were detected at a pipe exterior to the rear of the office. FID readings ranged from 0ppm to 1,100ppm. Elevated readings were recorded at the aforementioned pipe (with a peak reading of 1,100ppm), and at two pipes in the main shed (peak concentrations were recorded as 63ppm and 105ppm). All other FID readings were low. During monitoring event No.3, elevated concentrations of methane were detected in a drain behind the large main shed (0.2% v/v) and in a manhole in the shed (6.9% v/v). Elevated concentrations of carbon dioxide were detected at 5No. locations (all drains and manholes) ranging from 0.2% v/v to 3.2% v/v. FID readings ranged from 0ppm to 1000ppm, with elevated concentrations detected at 5No. locations (all drains or manholes).

#### *Sligo Fuels*

Elevated concentrations of methane and carbon dioxide were not detected during monitoring events No.1 and 2, where FID readings ranged from 0ppm to 0.6ppm during monitoring event No.1 and from 0ppm to 15ppm during monitoring event No.2. 1No. elevated concentration of carbon dioxide was detected during monitoring event No.3 at a concentration of 1.9% v/v in a manhole, while methane was not detected. FID readings ranged from 0ppm to 30.1ppm with 1No. elevated reading of 30.1ppm at another manhole.

#### *Celtic Anglian Water Ltd.*

Elevated concentrations of methane and carbon dioxide were not detected during monitoring events No.1 and 2. FID readings ranged from 0ppm to 1.7ppm during monitoring event No. 1 and from 0ppm to 1.4ppm during monitoring event No. 2. During monitoring event No. 3, elevated concentrations of methane (0.1% v/v at 3No. locations) and carbon dioxide (ranging from 0.4% v/v to 0.6% v/v) were detected at 2No. drains and 1No. manhole just outside the entrance gate. Elevated FID readings were also detected at these locations and ranged from 105ppm to 210ppm. FID readings were not elevated within the property itself. Drains and manholes along the road through the landfill were also checked during monitoring event No.3 and elevated readings of any parameters were not detected.

#### *Cold Chon*

Elevated concentrations of methane or carbon dioxide were not detected at this location. During monitoring event No.1, FID readings ranged from 0ppm to 35.1ppm, with several elevated readings detected within the office bungalow. During monitoring event No.2, FID readings ranged from 0ppm to 3.0ppm. During monitoring event No.3, FID readings ranged from 0ppm to 40.1ppm. 1No. elevated reading of 40.1ppm was detected in a manhole in the yard.

#### *Greenstar*

Elevated concentrations of methane and carbon dioxide were not detected during the first two monitoring events. FID readings ranged from 0ppm to 1.3ppm during monitoring event No.1, and from 0ppm to 3.6ppm during monitoring event No.2. Elevated concentrations of methane (0.4% v/v) and carbon dioxide (1.1% v/v) were detected during monitoring event No.3 at a fire hydrant manhole and FID readings at this manhole fluctuated between 421ppm and 1,800ppm. No other elevated readings were detected on this property during monitoring event No. 3.

#### *Ms. Jean Dolan's house*

This property was monitored first during October 2009 prior to the other properties and was not monitored in January 2010. Readings were not taken with the FID during this first survey. Elevated concentrations of methane or carbon dioxide were not detected during any of the three monitoring events. FID readings ranged from 0ppm to 0.5ppm during monitoring event No.2 and from 0ppm to 0.3ppm during monitoring event No.3.

## **6.0 TIER 1 RISK ASSESSMENT**

### **6.1 Landfill Material**

Analytical results indicated that the landfill material is generally composed of inert or non-hazardous material. Four samples exceeded the WAC for TOC for inert landfills, however, these elevated TOC result are not considered significant as according to the Council Decision (2003/33/EC) if the value is not achieved “a higher limit value may be admitted by the competent authority, provided that the DOC value of 500mg/kg is achieved at L/S = 10 l/kg” for inert landfills. A higher DOC value of 800mg/kg and 1,000mg/kg is permitted for non-hazardous and hazardous landfills, respectively. All of the samples reported DOC concentrations between 20 and 50mg/kg. Other than TOC, molybdenum, sulphate and total dissolved solids were the only parameters to exceed the inert WAC although all complied with the non-hazardous WAC.

### **6.2 Leachate**

It has been established that leachate is present in the landfill given that it was encountered during the intrusive investigative works. Leachate results were compared against published minimum and maximum observed ranges for acetogenic and methanogenic leachates (EPA (2000) Landfill Manuals, Landfill Site Design) for guidance purposes. All samples and parameters were either below or within the published guideline values for acetogenic and methanogenic leachate composition with the exception of one pH sample collected at BH13 (9.96pH units). The majority of samples contained concentrations lower than the published range for leachate.

### **6.3 Groundwater and Surface Water**

Analytical results indicate that groundwater and surface water has been impacted by a number of contaminant sources including waste materials from the former landfill, tidal intrusion and other sources. Please note that as stated previously given that there are no users of groundwater in the area due to saline intrusion, the aquifer as a drinking water supply will not be assessed any further.

#### *Waste Materials*

The waste materials deposited at the former landfill in Finisklin are generating leachate as detailed above. While it is not possible to pinpoint exactly which compounds are as a direct result of the landfill it is reasonable to assume that the landfill is a contributory factor to the elevated concentrations of a number of parameters observed in the groundwater and surface water samples.

#### *Evidence of Tidal Intrusion*

A number of parameters clearly exceeded the relevant groundwater target values and the Irish Surface Water Standards (SI No. 272 of 2009) due to the proximity to the sea and the fact that the former landfill at Finisklin is reclaimed from the mudflats. Parameters that exceeded the relevant standards which are indicative of tidal influence include electrical conductivity, chloride, total dissolved solids, sodium, potassium and magnesium as they are typically elevated in seawater. In addition to the groundwater impact it is likely that the surface water seeps at the base of the landfill embankment have been strongly influenced by tidal waters entering and leaving the landfill site as well as the leachate present within the landfill body.

#### *Other sources*

Other parameters, not typically associated with either tidal influence or naturally occurring contaminants (with the exception of some metals), were also identified and include ammonia,



MRP, total and faecal coliforms, boron, arsenic, nickel, manganese and iron and this may or may not reflect an impact from the former landfill at Finisklin or potentially from other sources including:

- The former practice of discharging untreated sewage effluent to the harbour;
- Diffuse agricultural sources;
- Discharges from the adjoining industrial facilities such as point source septic tanks; and,
- Waste materials that have been deposited outside the boundary of the former landfill.

The elevated concentrations of parameters such as total and faecal coliforms detected in groundwater would indicate that it has been impacted by organic waste sources. This is not unexpected considering that up until fairly recently the untreated effluent from Sligo Town discharged directly into the estuary. There is also evidence from reports commissioned by Sligo County Council (Aquafact, 2009) that elevated concentrations of E.coli (a type of faecal coliform whose presence in water is a strong indication of recent sewage or animal waste contamination) have been detected at a number of occasions within the River and Estuary network in the area and it is likely that these sources have also been impacting the groundwater in the area (Refer to Table 15 below) in addition to the possible impact of diffuse agricultural and point source septic tank inputs.

**Table 15:** 2009 Sligo Seasonal E. Coli Values (cfu/100ml) (Aquafact, 2009)

| Station | Location                                    | Spring | Summer | Autumn | Winter |
|---------|---------------------------------------------|--------|--------|--------|--------|
| 1       | Blue Lagoon                                 | 5      | 4      | 44     | 10     |
| 2       | JFK Parade                                  | 2      | 71     | 79     | 9      |
| 3       | Key Street Car Park                         | 46     | 123    | 435    | 380    |
| 4       | Hughes Bridge                               | 29     | 331    | 115    | 320    |
| 5       | Deepwater Quay                              | 200    | 240    | 38     | 670    |
| 6       | 1 mile downstream of proposed outlet (WWTW) | 600    | 6300   | 980    | 8800   |
| 7       | Cummeen Strand                              | 52     | 69     | 435    | 820    |
| 8       | Rosses Point (end of main pier)             | 290    | 13     | 29     | 520    |

Similarly, it was identified in the Water Framework Directive (WFD) monitoring programme that pressures in the locality in addition to the landfill included the diffuse pollution from agricultural activities and point source pollution from septic tanks and industrial facilities. The Water Framework Directive (WFD) risk assessment for estuarine waters indicated that the Garavogue Estuary is 'probably at risk of not achieving good status' and the risk assessment for coastal waters indicated that Sligo Harbour and Bay were 'at risk of not achieving good status' by 2015' (CAAS, 2009).

The EPA published a Water Quality in Ireland Report 2007-2008 which reported that groundwater upgradient of the former landfill was contaminated with >100cfu/100ml faecal coliforms, further evidence of upgradient and offsite sources of contamination.

Please note in addition there is significant variation in the distribution of contaminants in the groundwater beneath the site. This may be due to the impact of the tidal cycle on the groundwater as it is clear from the data loggers that tidal changes do impact on groundwater direction and thus some of the contaminants detected may have migrated from offsite sources.

Similar to the groundwater analytical results, it is likely that the surface water samples have been impacted by the former landfill as well as adjacent filled sites and other offsite sources. However, although surface water results from seeps at the base of the embankment indicate that elevated concentrations of some contaminants are entering the SAC, the findings of the

desk studies confirm that the water quality of the harbour is generally good with the exception of the faecal coliforms (refer Table 15).

The Sligo Harbour/Garavogue Estuary is extensively monitored and evaluated by a number of key stakeholders for different purposes. Some examples include:

- Water sampling completed at various locations along the length of the River Garavogue and transitional waters as part of the operation of the WWTW (refer Table 15).
- Shellfish mandatory and guideline values and monitoring. Shellfish mandatory and guideline values were not breached in any samples collected from 2004 to 2008. Although faecal coliform results indicated an exceedance in November 2008 and February, May and August 2009.
- Water Framework Directive (WFD) monitoring programme. The WFD status of the coastal water body, within which the outer part of the shellfish area is situated is classified as 'high'. The transitional water body within which the inner part of the shellfish area is situated as well as the Garavogue River itself that discharges to the shellfish area are both classified as 'good' and considered satisfactory (Western River Basin District, 2009).
- Water Quality in Ireland 2007-2008 – EPA document designates the Garavogue Estuary, Sligo Harbour and Sligo Bay as 'unpolluted'. Biological indicators are reported as 'good' for the Garavogue Estuary, and as 'high' for Sligo Harbour and Sligo Bay. Generally dissolved inorganic nitrogen and phosphorus were reported as being higher in the Garavogue Estuary when compared to Sligo Harbour or Sligo Bay, however the reported concentrations were still low. This report identified that groundwater up-gradient of the former landfill was contaminated with >100cfu/100ml faecal coliforms (EPA, 2009a).
- Bathing Water Results (2009) were all compliant with mandatory values (European Environment Agency, 2009).
- Water quality in Ireland – the 2004 – 2008 Survey of Tidal Waters. This identified the water as intermediate quality with <4,600ecoli/100g or classification 'B' (EPA, 2008).
- Urban Waste Water Discharges (a report for the year 2006 and 2007) – identified that the coast was not sensitive (EPA, 2009b).
- An Assessment of Intertidal Assessments in the Garavogue River and Estuary – completed by Halia Oceanographic Consulting Services on behalf of Sligo County Council (2004).

#### *Dilution Contributions*

The potential impact on the Garavogue Estuary associated with leachate generated within the former landfill was evaluated based on the estimated dilution contributions from the tidal exchange and freshwater flux into the estuary.

The estimated volume of leachate generated from precipitation infiltration at the former landfill was 22,500m<sup>3</sup>/a (62m<sup>3</sup>/d) based on the EPA methodology (EPA, 2000). The average concentration recorded on site for BOD, ammoniacal nitrogen and MRP were considered representative of leachate generated at the former landfill. Therefore the daily loading on the receiving Garavogue Estuary, assuming all leachate discharged to the estuary was estimated as:

- BOD: 3kg/d
- Ammoniacal nitrogen: 2kg/day
- MRP: 0.3kg/day

Based on available dry weather flow data for the Garavogue River 5.5km upstream of landfill (Station 35073) the estimated available assimilative capacity of the river was calculated based on the assumption that water quality upstream of the former landfill was 50% of the

relevant surface water standards for the parameters BOD, ammoniacal nitrogen and MRP. Assuming that the target water quality downstream of the former landfill was 95% of the relevant standard, the relevant dilution factors were conservatively estimated as:

- BOD: factor of 30
- Ammoniacal nitrogen: factor of 3
- MRP: factor of 100

Given that the former landfill is subject to tidal impact and influence from the tidal cycle, it is also considered that a considerably higher dilution factor would be provided by the tidal flux than that provided by the freshwater inflow from the Garavogue River. Therefore, it is considered that there is considerable dilution capacity within the Garavogue Estuary water body. These conservative dilution calculations, supported by the extensive amount of relevant baseline data would clearly indicate that although leachate is being generated at the former landfill, it is not significantly impacting (via groundwater and surface water pathways) on the quality of the receiving waters.

## 6.4 Gas

The groundwater monitoring wells (BH1 to BH4) installed in the Glencar Formation were fitted with landfill gas caps and generally recorded methane concentrations below 1% v/v (Figure 5) with occasionally higher concentrations up to just over 7% v/v. Variations in carbon dioxide are similar (Figure 6), up to a maximum of 4.4% v/v and mirror the methane variations. The most likely cause of this is probably low concentrations of hydrocarbon or other organic material in leachate that is entering the groundwater and degrading slowly to produce gas. It is also possible that the solid part of the well through the landfill material is allowing small volumes of gas into the pipe at the joints, although this is less likely because of the bentonite surround. It is unlikely to represent gas migration downwards because the site does not have an engineered cap and is therefore unlikely to generate sufficient gas pressure to force gas downwards, especially through the soft clay/silt below which will have a low permeability.

**Figure 5: Methane in Glencar Formation**

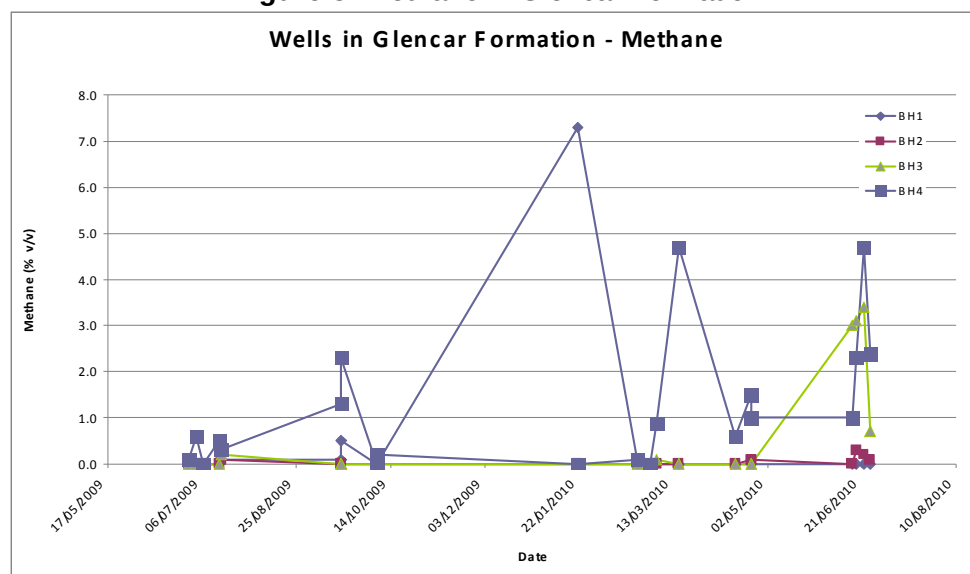
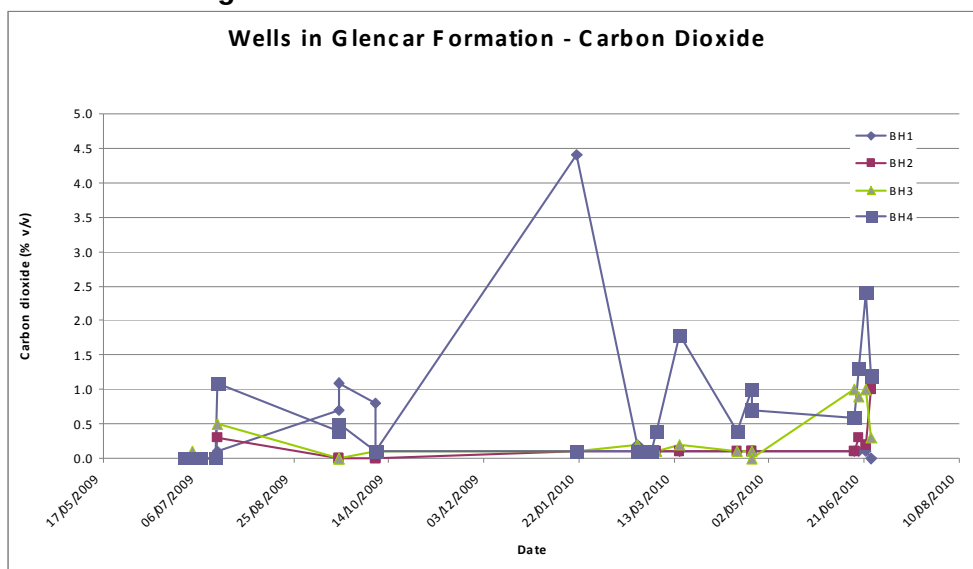


**Figure 6: Carbon dioxide in Glencar Formation**



#### 6.4.1 Southern Fill area and Beyond the southern boundary

In the southern filled area of the former landfill (refer Figure 2) two wells (BH7 and BH14) recorded elevated methane concentrations up to 80% v/v (Figure 7). In one borehole (BH14) the methane concentrations are variable from not detected up to 80% v/v, and this is typical of older landfill material. The carbon dioxide concentrations are low in the same well (Figure 8), generally less than 5% v/v, and this indicates that the methane present is historical gas and current generation rates are low (the carbon dioxide is low because it is more soluble in water and is removed over time). However BH7 has more stable methane concentrations with carbon dioxide concentrations around 20% v/v suggesting that gas generation is still occurring at this location, albeit at less than peak rates. There is also hydrocarbon contamination present in some exploratory holes in this area and these concentrations of gas could also be occurring as a result of degradation of the hydrocarbons.

Given the results of the geophysical survey and the finding from the site investigation this is likely to be a localised effect, but it could be present in other locations in the southern part of the landfill. Therefore this area can be characterised as generally low gas generation but with areas of moderate gas generation. This is based on a combination of the gas monitoring data and the soil descriptions. Similar gas results were measured in BH23 located outside the landfill beyond the southern boundary. This well is installed in similar fill material and it most likely that the gas in this well is present as a result of generation below that area, rather than gas migration from the former landfill.

**Figure 7: Methane in southern area of landfill filled from 1977 - 1985**

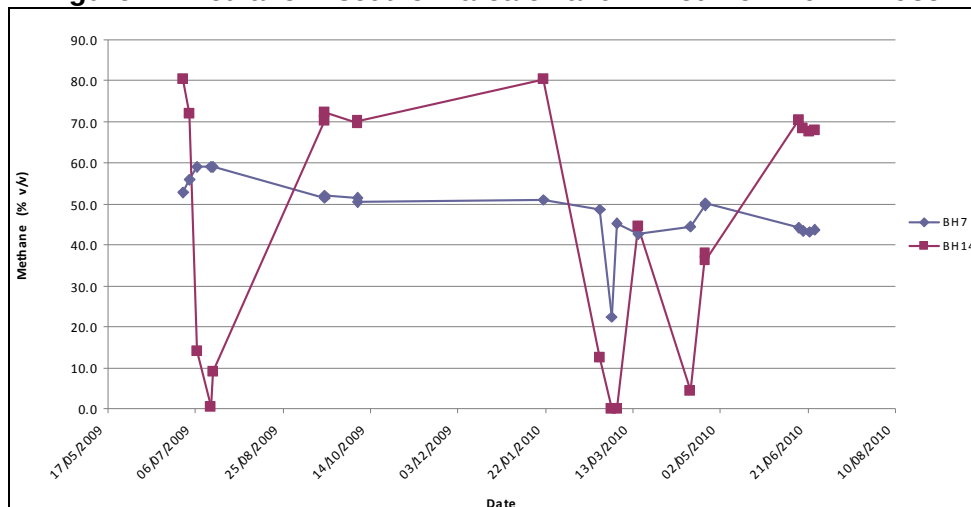
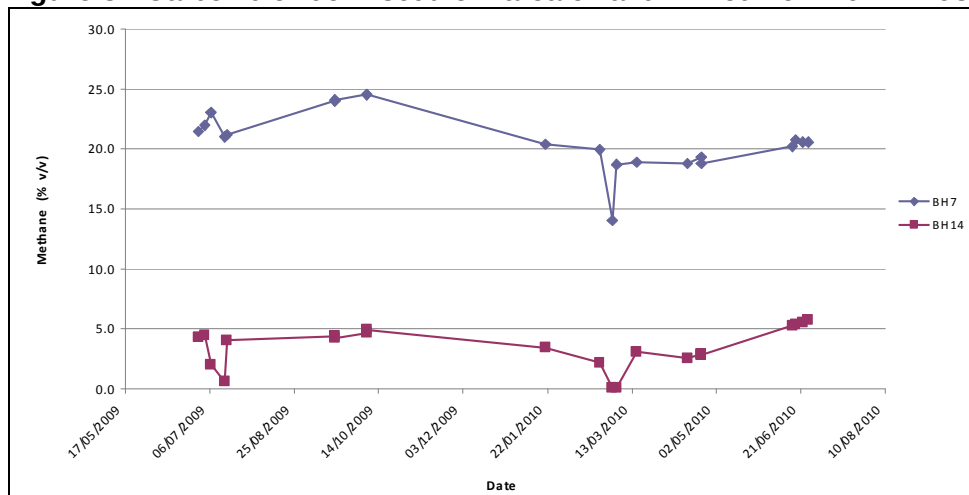


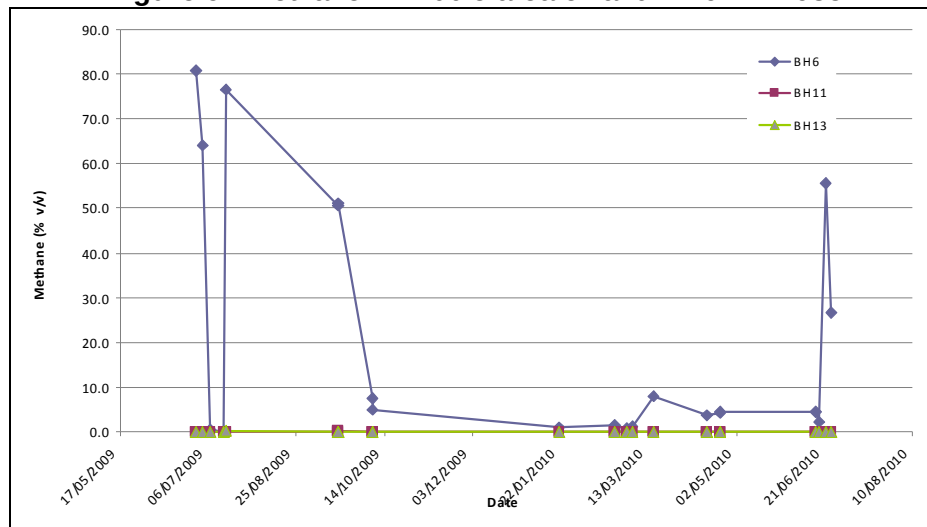
**Figure 8: Carbon dioxide in southern area of landfill filled from 1977 - 1985**



#### 6.4.2 Middle area filled 1985 to 1994 (earlier fill)

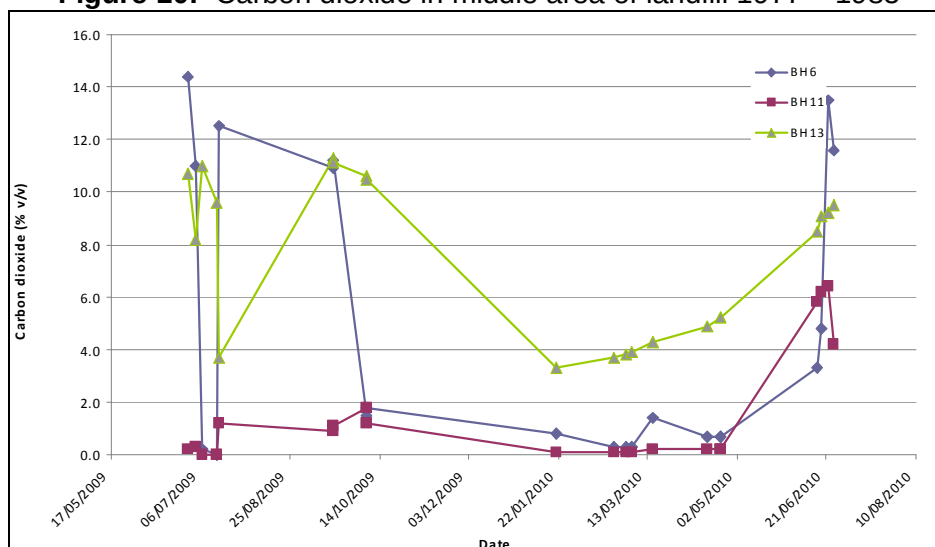
The middle area filled from 1985 to 1994 is illustrated on Figure 2. Gas monitoring results from this area (BH6, BH11 and BH13) are summarised in Figures 9 and 10. These results show initially high concentrations of methane up to around 80% v/v in BH6 that gradually reduce over the first few monitoring visits. The other wells (BH11 and BH13) did not record elevated methane concentrations. On more recent visits higher methane concentrations have again been recorded in BH6, indicating variable conditions in this part of the site.

**Figure 9: Methane in middle area of landfill 1977 - 1985**



The carbon dioxide concentrations show a similar trend of initial peaks (up to around 14% v/v) reducing as monitoring progresses to generally less than 5% v/v. In later visits the carbon dioxide has increased again, indicating variable conditions.

**Figure 10: Carbon dioxide in middle area of landfill 1977 – 1985**



These initial peaks are typical of material that is generating low volumes of gas and may not be representative of the generating potential of material of this age. This is confirmed by the more recent recovery in gas concentrations to former elevated concentrations. Flow rates are very low and did not exceed 0.1l/h.

#### 6.4.3 Northern area filled up to 1994

The wells installed in the northern portion of the former landfill show consistently high methane concentrations between 50% v/v and 80% v/v, together with elevated carbon dioxide concentrations generally between 20% v/v and 25% v/v. This ratio of methane to carbon dioxide indicates that active gas generation is still occurring. Borehole flow rates are low with a maximum of 0.5l/h recorded indicating that generation is possibly past its peak. This is not consistent with the other site specific information including age and ratio of methane to carbon dioxide. In addition there was an unexplained but significant fall in gas concentrations during two of the monitoring events. However these two isolated monitoring

results do not impact on the conclusions that are drawn from the remaining data in these wells.

**Figure 11: Methane in northern part of landfill**

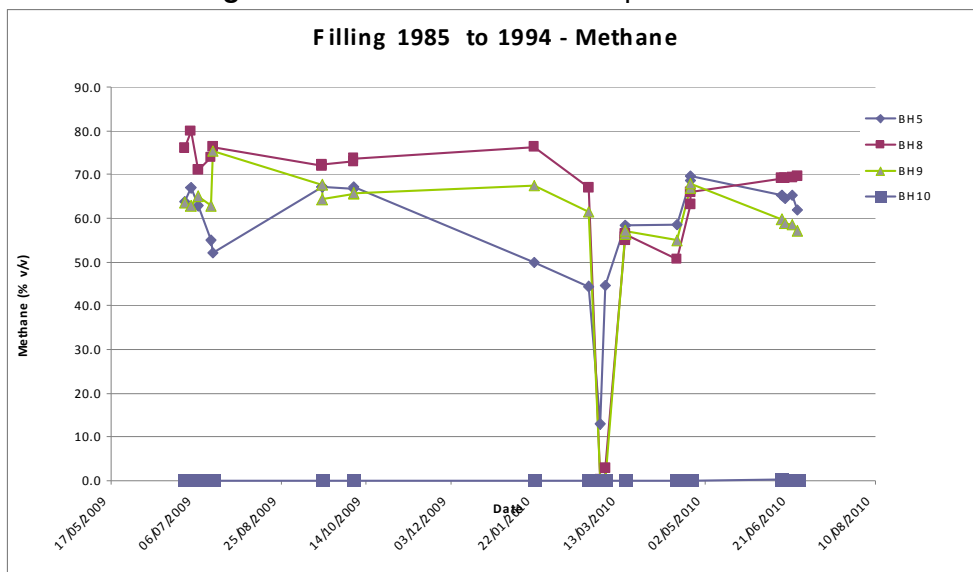
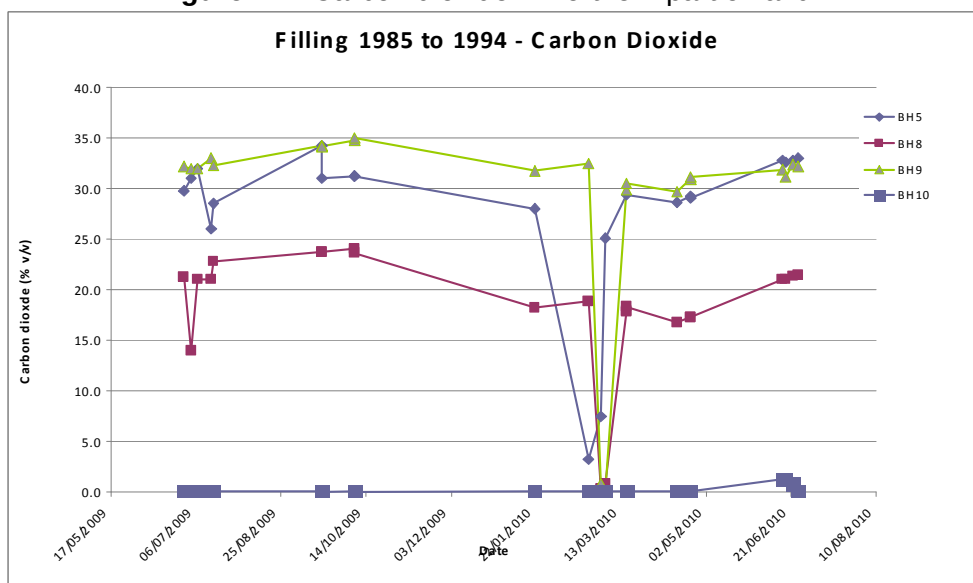


**Figure 12: Carbon dioxide in northern part of landfill**



#### 6.4.4 Gas monitoring data outside former Finisklin Landfill boundary Older areas of fill to the east and south

The methane and carbon dioxide concentrations were similar to those in the wells installed in the landfill in the southern part of the site. Data is summarised in Figures 13 and 14 (BH20 – BH23). Borehole flow rates from the more recent monitoring were slightly lower than within the landfill boundary, but of a similar order of magnitude. BH20 is located within the WWTW, where the subsurface soil comprises of hydraulic fill overlying silt and sand. BH21 and BH22 are located along the eastern boundary of the site, and are installed in reclaimed land. BH23 is located to the south east of the site, and is installed in part of the original landfill dating from the 1950s and 1960s.

**Figure 13: Methane to east and south of landfill boundary**

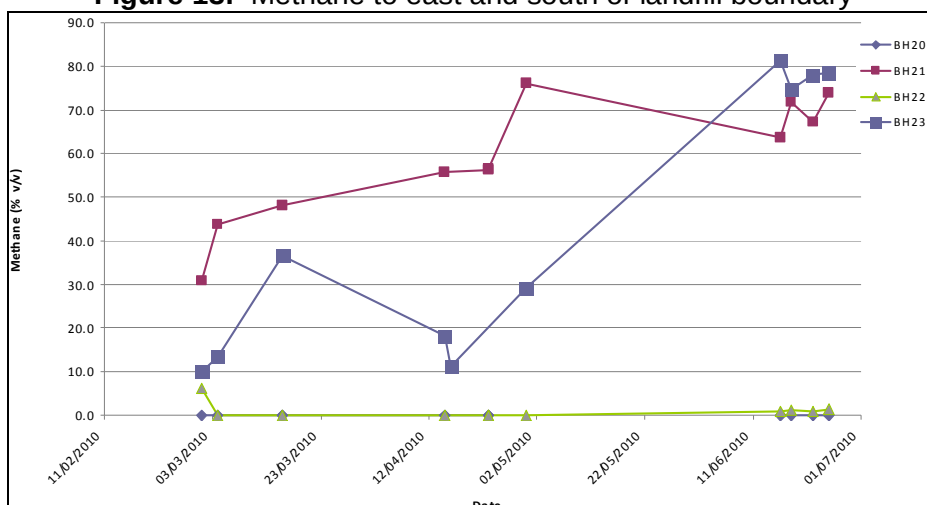
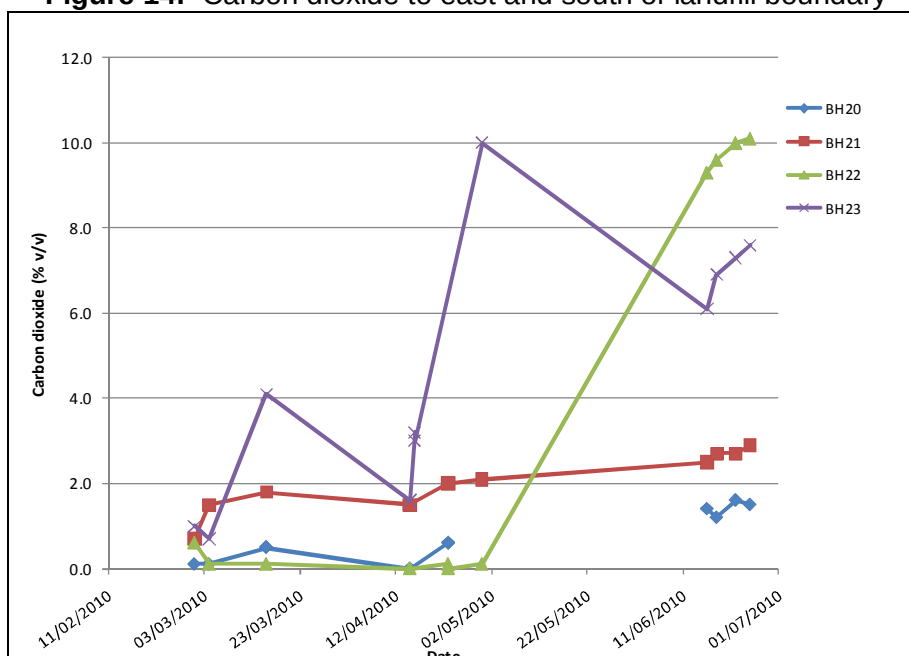


**Figure 14: Carbon dioxide to east and south of landfill boundary**



This gas could be the result of gas generation from the fill material below these areas, rather than offsite migration from the former landfill. The likelihood of this is much greater at the southern end of the site, but towards the northern end the possibility that at least some of the gas is migrating from the former landfill increases due to the age of the waste.

#### *Outside filled areas beyond western boundary*

These wells (BH24 and BH25) did not record any significant methane concentrations (a maximum steady state concentration of 0.1% v/v which is within the resolution of the monitor). Peak values were occasionally recorded up to 0.9% v/v which indicates that some slight gas migration may be occurring, although given the geology it is more likely that the gas present is from the made ground around the well. The higher readings were recorded in BH25 outside the northern part of the site where there is a higher risk of gas migration. Carbon dioxide was detected on most visits with concentrations varying between 0.1% v/v and 2.2% v/v. This may indicate that gas migration is occurring, but the gas could also be present as a result of acidic groundwater or percolating rainwater acting on the limestone beneath.



Borehole flow rates were negligible with a maximum positive flow of 0.2l/h recorded. This tends to suggest that if any gas migration is occurring (which is by no means certain given the geology) it is happening slowly by diffusion.

#### *Internal Gas Monitoring*

##### Internal Survey No. 1

On the first visit in 2010 landfill gas was not detected at significantly elevated concentrations at any of properties. Very low concentrations of methane were detected using an FID in several properties around the site at concentrations up to 10.2ppm. This is within typical concentrations that can be found inside buildings due to sources other than landfill gas and often the higher readings were recorded under sink cupboards or toilets/showers where cleaning fluids, deodorants, etc. can cause a reading on the FID.

The only place where the slightly elevated concentrations possibly indicated the potential for landfill gas migration into a building was the Cold Chon site. Here the FID recorded concentrations of gas up to 35.1ppm in occupied spaces within the administrative offices known as the 'bungalow'. Although not a cause for immediate concern (the concentrations of gas detected are 0.0035% v/v which are well below the normally considered action levels inside buildings of 0.1% v/v), when considered with other data, this site was considered to be of a higher potential risk.

##### Internal Surveys No. 2 & 3

Two subsequent visits to the Cold Chon facility on the 18<sup>th</sup> June 2010 and the 24<sup>th</sup> June 2010 respectively to carry out internal monitoring did not detect elevated gas concentrations within the occupied space of the property and therefore it is likely that the initial concentrations detected represented an alternative source of readings including cleaning fluids, etc.

Further internal monitoring was carried out on all the offsite properties on two occasions between the 17<sup>th</sup> and the 25<sup>th</sup> June 2010. In general the results were low with the exception of elevated concentrations recorded in service ducts in the Erin Recyclers Site (next to Cold Chon and closer to the landfill boundary). This indicates that landfill gas is migrating into these buried services, although it appears to be at a rate that is not sufficient to cause elevated concentrations within the occupied spaces (the ducts in the site come up in well ventilated spaces, some outside). Again although not cause for immediate concern the presence of gas in the ducts leading into occupied spaces was brought to the attention of the occupiers who were recommended to seal any ducts that are inside buildings using expanding foam in the duct itself.

Up to 0.9% v/v methane and 8.4% v/v carbon dioxide was recorded in one particular pipe on the Erin Recycling Facility shown in Figure 15, although this pipe may be a vent pipe that is venting gas from below the concrete slab that the temporary steel cabin is located on (Internal survey No. 3). From the same location the FID recorded 1,100ppm peak and 300ppm stable gas concentrations. Up to 7.4% v/v methane and 3.2% v/v carbon dioxide was recorded within a drain in the large shed to the front of Erin Recyclers (see Figure 16) (Internal survey No. 3). At the same time the FID recorded a gas concentration of 1,000ppm.

In addition, up to 0.4% v/v methane and 1.1% v/v carbon dioxide was recorded within a drain on the Greenstar property, while the FID indicated a gas range of 421ppm to 1,800ppm (Internal survey No. 3).

Carbon dioxide concentrations up to 1.9% v/v were recorded in a manhole located on the Sligo Fuels property, however no methane was identified. FID results indicated a gas concentration of 5.2ppm at the same location.

Readings of up to 5% methane and 0.4% carbon dioxide were recorded in a pipe (drain) location exterior to the premises at Duncan's Island, while the FID recorded a measurement of 1,207ppm, indicating that gas is migrating to the south of the site.

Carbon dioxide readings up to 0.6% v/v were observed in manholes adjacent to the entrance gate to the WWTW. Low level methane concentrations (i.e. 0.1% v/v) were also observed with the FID recording a maximum concentration of 210ppm.

The measurement of low concentrations of carbon dioxide and methane within drains can occur particularly in the event of hydrocarbon contamination, or foul or combined sewers. Low levels of carbon dioxide and occasionally methane were observed in a number of manholes and may not be reflecting gas from the landfill. However, it would appear that landfill gas is migrating from the subsurface into service pipes in Erin Recycling. Investigative works have not been completed on this site however, it is understood that this site is underlain by landfill material. Therefore, there is the potential that the gas migrating into the service pipes may possibly reflect onsite landfill gas generated from waste beneath the site itself or possibly the horizontal migration of landfill gas from the former Finisklin landfill under assessment.

**Figure 15:** Pipe in ground with high gas concentrations located to the rear of a portacabin in Erin Recyclers.



**Figure 16:** Drain with high gas concentrations in large front shed at Erin Recyclers.



## 6.5 Summary of Tier 1 Risk Assessment

### *Soils/Waste*

The majority of the soils/waste parameters complied with the inert WAC. All other parameters complied with the non-hazardous WAC.

### *Leachate & Surface Water /Groundwater*

Given that there is no landfill liner and no confining layer present there is a pathway between the leachate and the groundwater body beneath. There is also a direct pathway between the leachate and surface water seeps from the landfill. It has been calculated that based on the available assimilative capacity within the receiving water bodies that leachate at the former landfill is unlikely to be significantly impacting these receiving water bodies. This is further supported by published reports that indicate there is no significant impact on the receiving water bodies from the leachate within the former landfill (or from other contributory sources such as the waste located beyond the landfill boundary, the former practice of discharging untreated sewage, diffuse agricultural and point source emissions from surrounding industrial and residential properties). It is therefore considered that further assessment is not required.

### *Landfill Gas*

Elevated concentrations of landfill gas have been identified both onsite and offsite during the comprehensive monitoring and assessment programme undertaken as part of this assessment, therefore, it was considered that the potential for the migration of landfill gas offsite needed to be addressed further in a detailed quantitative gas risk assessment.

**Table 16:** Tier 1 Summary

|                             | Summary                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soils                       | As expected, waste complied with Inert/Non-hazardous limits.<br>Tonnage of landfill material – estimated 625,000t<br>Tonnage of capping material – estimated 250,000t                                                                                                                                                                                          |
| Leachate                    | Leachate identified and compared to typical composition. Generally concentrations observed were lower than typical concentrations or within the range. Based on the available assimilative capacity within the receiving water bodies it is calculated that leachate at the former landfill is unlikely to significantly impact on the receiving water bodies. |
| Surface Water & Groundwater | Pathway exists between these water bodies and leachate generated by the former landfill. Based on a desk-based study of information relating to the quality of water in the Garavogue Estuary there is no appreciable impact from the landfill or any other sources on the receiving water body.                                                               |
| Gas                         | Elevated concentrations of landfill gas were observed. Further detailed quantitative risk assessment is required to assess the risk of gas migrating to offsite properties.                                                                                                                                                                                    |

## **7.0 DETAILED GAS RISK ASSESSMENT**

MOR, in conjunction with The Environmental Protection Group (EPG) Ltd., completed a detailed risk assessment, to assess the risk of landfill gas migration to off-site receptors. EPG are the leading experts in landfill gas risk assessment, and the technical director, Steve Wilson, is co-author of several ground gas reference books, including the 'Ground Gas Handbook' (2009) and 'Assessing Risks Posed by Hazardous Ground Gases to Buildings' (2007).

### **7.1 Tier 2 detailed quantitative risk assessment**

The conceptual ground gas model for the former landfill is shown below in Figures 17, 18 and 18. The key points to note are:

- The landfill material in the southern part of the site has been in place for 33 years and is unlikely to be generating large volumes of methane or carbon dioxide at the present time.
- Filling took place progressively to the north and thus the volume of gas currently being generated is likely to increase in this direction, with the highest risk part of the site located at the northern end where filling was completed 16 years ago in 1994.
- The landfill is unlined, has no engineered capping layer and there is no landfill gas collection or venting system installed.
- The site investigation indicates that the landfill material is very variable and includes a large proportion of construction and demolition waste. There are randomly scattered areas where significant domestic refuse is located.
- There is landfill material outside the current site boundary below the industrial area to the east and south. At the northern end of the site there is evidence of possible gas migration to the surface below Erin Recyclers, although this is not conclusive because of the suspected gas source present directly below this facility.
- The landfill is relatively shallow in relation to its plan area.
- There are estuarine silts and sands that comprise silty clays and saturated sands that will inhibit gas migration in this stratum.
- The landfill material at present does not have an engineered cap and gas generated is probably venting through the cover soils in a diffuse manner.
- To the west of the former landfill the area is underlain by clayey soils that will limit the potential for widespread gas migration from the site.
- There are preferential pathways in the form of buried services that cross the former landfill alongside the access road to the WWTW.

Figure 17: Conceptual ground model - overall

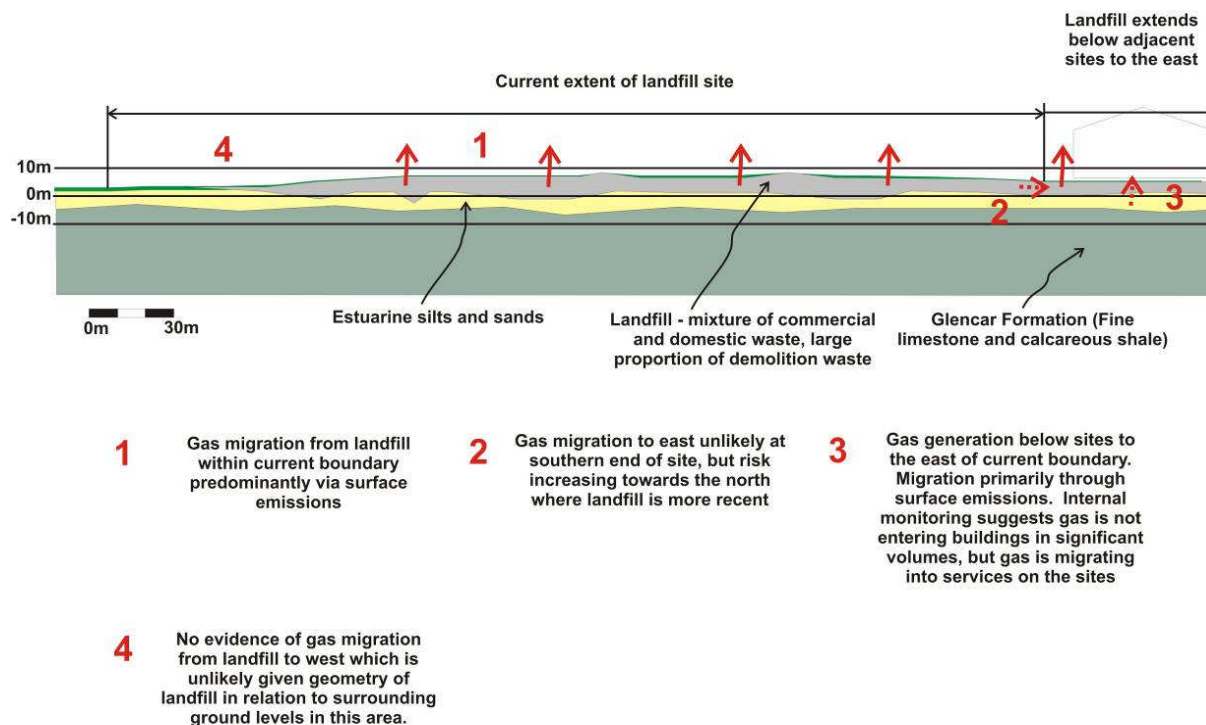


Figure 18: Conceptual ground model –Eastern boundary

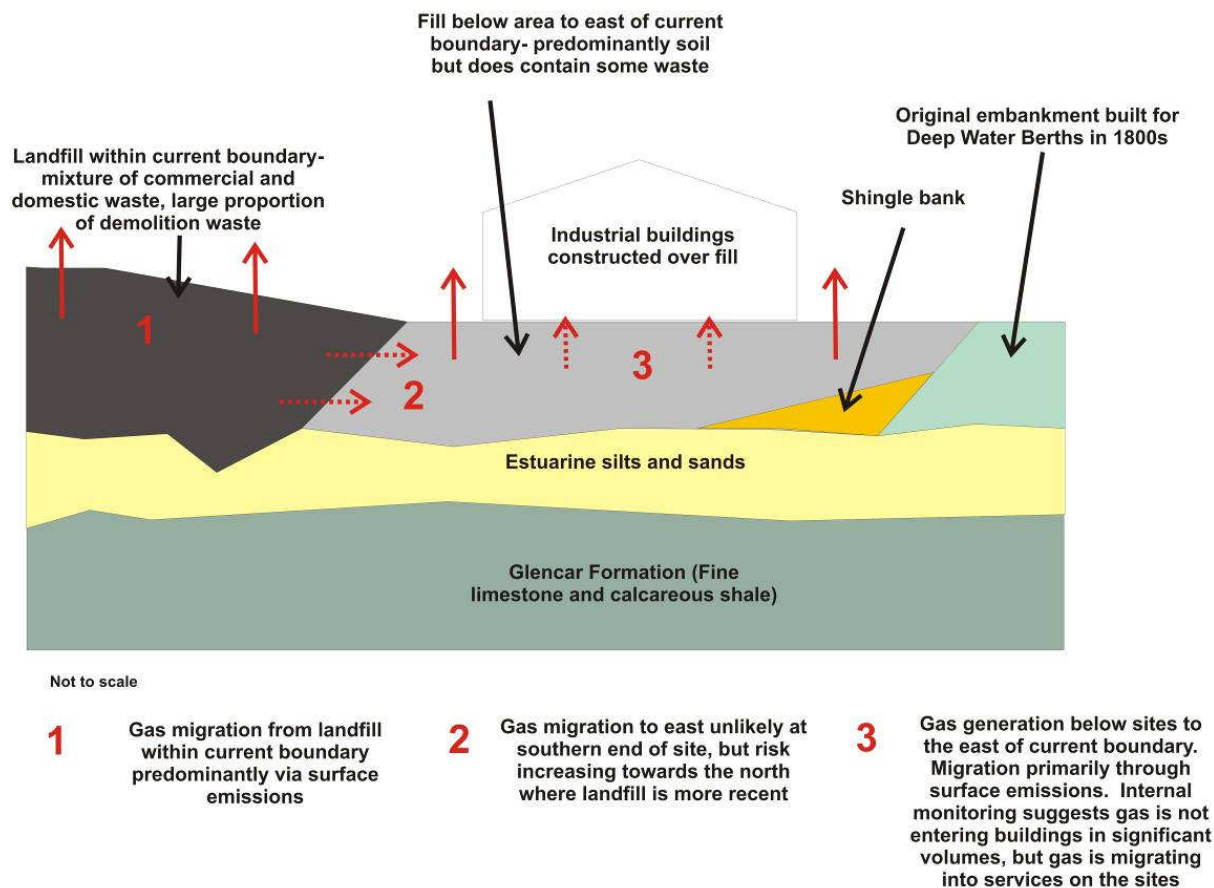
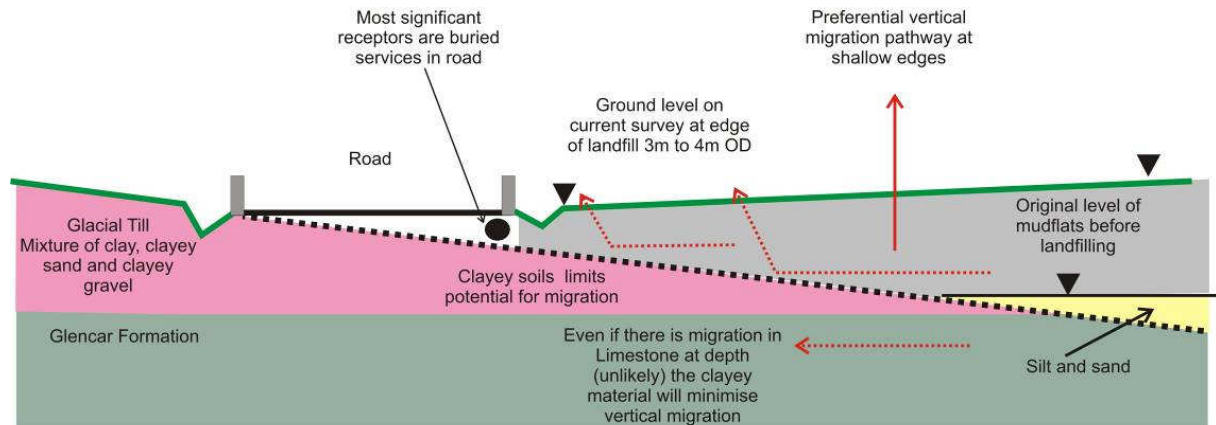




**Figure 19: Conceptual ground model –Western boundary**



Not to scale

## 7.2 Potential sources of gas

Based on the information provided the most significant potential source of landfill gas has been identified as the landfill material. There is also hydrocarbon contamination present in some wells (based on soil results) that can degrade to give small volumes of gas in the well but at high concentrations.

In addition there are also sources of carbon dioxide from the underlying geology (i.e. limestone) that need to be considered when assessing gas monitoring results outside the landfill. This is because often small concentrations of carbon dioxide up to about 15% can be recorded in wells drilled into limestone (as result of acidic water acting on carbonate material in the rock). The volumes of gas generated are very small, but are sufficient over time to build up to a recordable concentration in the very small confined volume of a monitoring well.

## 7.3 Generation potential

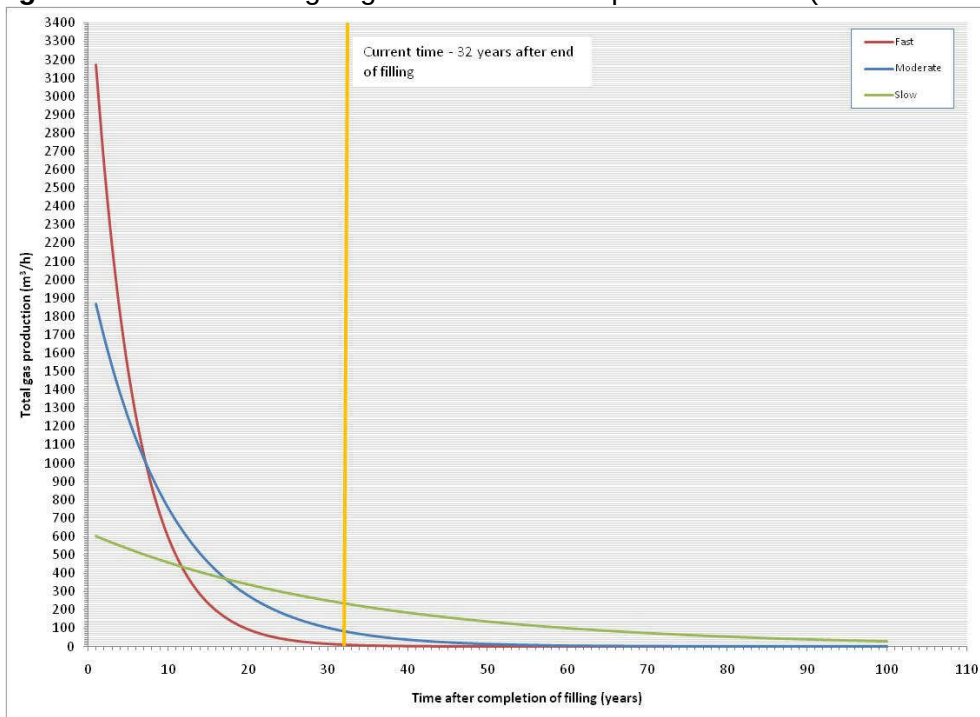
### 7.3.1 Landfill material

This material is in a variable state of decomposition. In the older parts of the landfill it is largely decomposed (based on evidence from the borehole records and the length of time it has been in the ground). It becomes progressively less decomposed towards the northern end of the site. There is a significant proportion of demolition waste in the site and the domestic refuse is randomly distributed around the site. In general the gas generation potential can be summarised as follows:

- 1958 to 1977 area – low risk assume 15% degradable material at time of filling.
- 1977 to 1985 area - moderate risk assume 30% degradable material at time of filling.
- 1985 to 1994 area - high risk assume 30% degradable material at time of filling.

An analysis has been undertaken to estimate the current rate of gas generation from this material using the equations from the Environment Agency report Guidance on the Management of Landfill Gas, LFTGN 03. The analysis has been undertaken based on the estimated degradable content of the landfill from the current investigation as discussed above.

**Figure 20:** Estimate of gas generation in older parts of landfill (southern end).



This preliminary estimate shows that the landfill material is likely to have decomposed significantly since it was first placed. At the southern end of the site it will now be approaching the residual stages of gas production which means that it cannot sustain the migration of large volumes of gas out of the ground. The results of the analysis are provided in Appendix N.

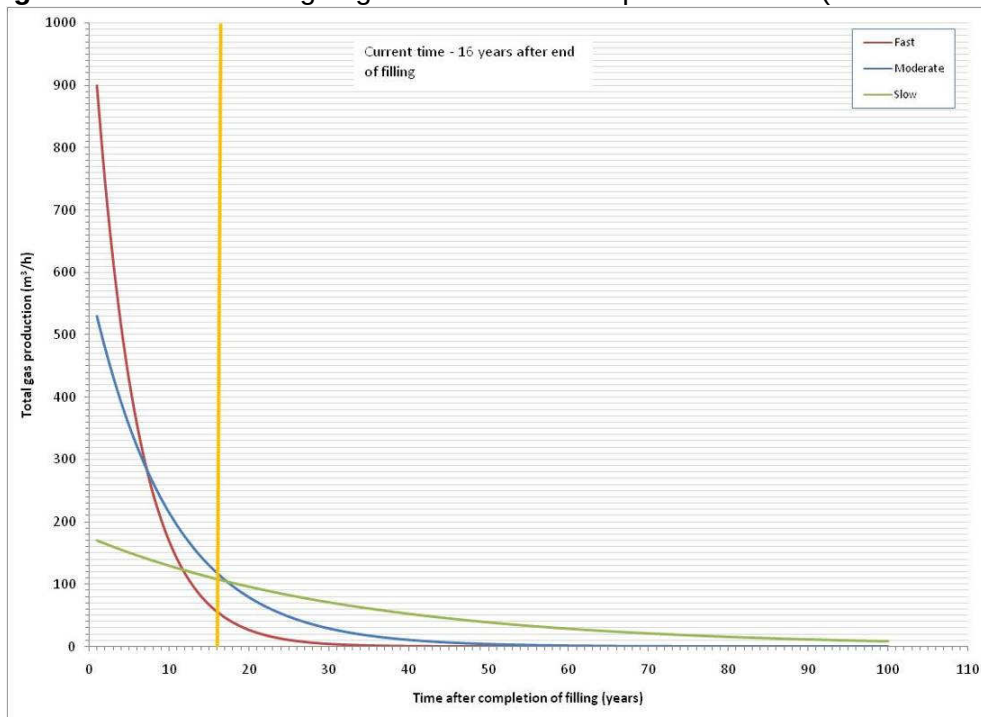
The current volume of methane likely to be emitted from the ground in the southern part of the landfill area is estimated to be sufficient to give an equivalent borehole flow rate of about 0.9 l/h to 8.0 l/h assuming a fast or moderate rate of degradation respectively. However, flow rates recorded on the site ranged from -1.1 l/h to 0.8 l/h; while the majority of readings recorded 0.0 l/h (i.e. no flow was present).

The results of the generation modelling show the most recent filled area is only just likely to be approaching the end of the period of significant gas generation. Thus the risk of gas migration and emissions is much higher in this area.

The current volume of methane likely to be emitted from the ground in the northern part of the landfill area is estimated to be sufficient to give an equivalent borehole flow rate of about 9 l/h to 18 l/h assuming a fast or moderate rate of degradation respectively.



**Figure 21:** Estimate of gas generation in recent parts of landfill (northern end).



### 7.3.2 Hydrocarbons

Hydrocarbon contamination is present in the landfill material. The hydrocarbons are organic material and will degrade to produce methane and carbon dioxide in wells. Some of the highest recorded concentrations of methane in the southern part of the former landfill are in wells where hydrocarbons are present or recorded in nearby holes. Despite the high concentrations recorded, the volumes of gas generated will be very low and would not be sufficient to cause off-site migration of gas to the surrounding area.

### 7.3.3 Gas in natural rocks

Ground gas (carbon dioxide) could be produced in small quantities in the Limestone present below this area. The gas is generated by the action of acidic groundwater and percolating rainfall on the carbonate material in the limestone. This gas will be trapped in the pore spaces in the ground and remains there unless disturbed by excavations, such as boreholes. Thus when wells are installed through the ground the carbon dioxide can accumulate in the well and give high concentrations. Again this does not indicate large volumes of gas and migration out of the ground is very unlikely. This source does need to be considered when assessing the results of gas monitoring in wells outside the landfill site as the presence of carbon dioxide does not necessarily indicate gas migration from the landfill.

## 7.4 Migration pathways

### 7.4.1 Off-site horizontal migration to east and south

The landfill material continues below the former landfill boundary to the east and south. This material will have varying permeability, but could provide a pathway for gas migration.

### 7.4.2 Off-site horizontal migration to west

At the western edge of the former landfill the waste material may be in contact with the natural Estuarine Silts and Sands or the Glencar Formation. Both of these strata are relatively impermeable; however they could potentially allow gas to migrate through them and so are considered in this assessment.

#### 7.4.3 Off-site horizontal migration to north

The northern boundary of the former landfill is a rock fill embankment. This will be permeable and will allow gas to migrate through it, into the atmosphere.

#### 7.4.4 Preferential pathways

There are services in the following locations that could potentially form preferential pathways:

- Along the access road to the WWTW;
- From part way along the WWTW access road to Deepwater Berths Road (along the boundary between NCF and Euroflow/Rocket Fuels); and
- Along Finisklin Road (assuming gas migrates to the services).

The services along the access road are all provided at minimum cover. The foul and surface water pipe work has cover ranging from 600mm at the entrance gate to up to 2,500mm on the access road at local high points. Electricity and communications service ducting have up to 1,000mm cover. Services installed on the Deepwater Berths Road have cover up to 1,000mm.

All the services are backfilled with granular surround and crushed rock or granular fill to the surface. In most cases the service trenches were over excavated below formation level and a layer of stone placed in the trench, so in essence most trenches were from 2,000 to 3,000mm deep. Because the granular fill comes to the surface the trenches will in effect act as venting trenches and gas is most likely to come to the surface rather than migrate for any great distance along them.

#### 7.4.5 Vertical/Horizontal migration

Landfill gas can potentially migrate vertically directly from the landfill material. It can also migrate vertically out of the ground outside the landfill area, after it has moved horizontally in the ground.

Horizontal migration may have occurred in the past and could still be occurring, with the risk increasing from the southern portion of the former landfill to the northern portion of the former landfill.

### 7.5 Receptors

The main receptors that have been identified in this detailed gas risk assessment are:

1. Existing houses and other buildings to the west of the site.
2. Industrial buildings to the east and south of the site.
3. Existing Site Users – occasional visits by Local Authority personnel.

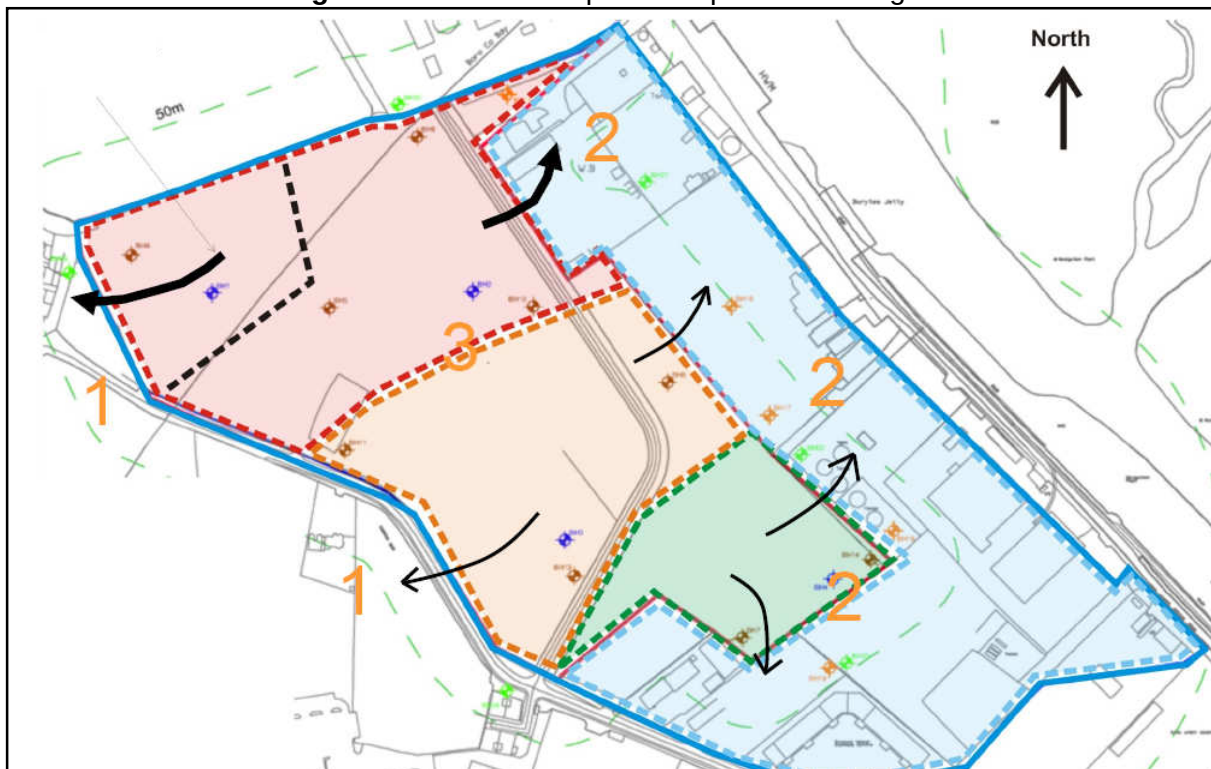
To the north of the former landfill the landfill gas will migrate through the rock fill embankment in a diffuse manner into the atmosphere where it will be diluted to very low concentrations. There are no buildings or similar features with confined spaces where it could accumulate and therefore there are no receptors at this boundary.

Similar emissions within the former landfill boundary in its current conditions will be diffuse through the cap and will dilute in atmosphere. Thus it is not considered that there are any receptors on site at present.

### 7.6 Pollutant linkage

The plausible pollutant linkages are shown in Figure 22. The numbering refers to the list of receptors identified in the previous section.

**Figure 22: Location of plausible pollutant linkages**



The area of landfill is currently open space with no buildings and in its present condition the volumes of gas being generated will be easily dispersed as it migrates out of the ground. There are no confined spaces for the gas to build up and thus there is no pollutant linkage in this respect and the risk is negligible.

Thus the plausible pollutant linkages that have been identified as the site stands at present are:

1. Gas  $\Rightarrow$  horizontal or lateral migration through the ground  $\Rightarrow$  buildings and occupiers off-site to the east, south and west.
2. Gas  $\Rightarrow$  vertical migration of gas after it has migrated off-site  $\Rightarrow$  buildings and occupants.

This risk assessment does not consider the risk posed by vertical migration of ground gas from the areas outside the current boundary.

## 7.7 Qualitative Assessment

The probability and consequences associated with the pathways that have been identified have been assessed qualitatively (i.e. descriptively) based on the current data and the preceding analyses and discussion. The probability and consequence terms are taken from the Ground Gas Handbook. The assessment is summarised in Table 17 and the areas discussed illustrated on Figure 23.

**Figure 23: Risk Assessment – Areas of pollutant linkages**

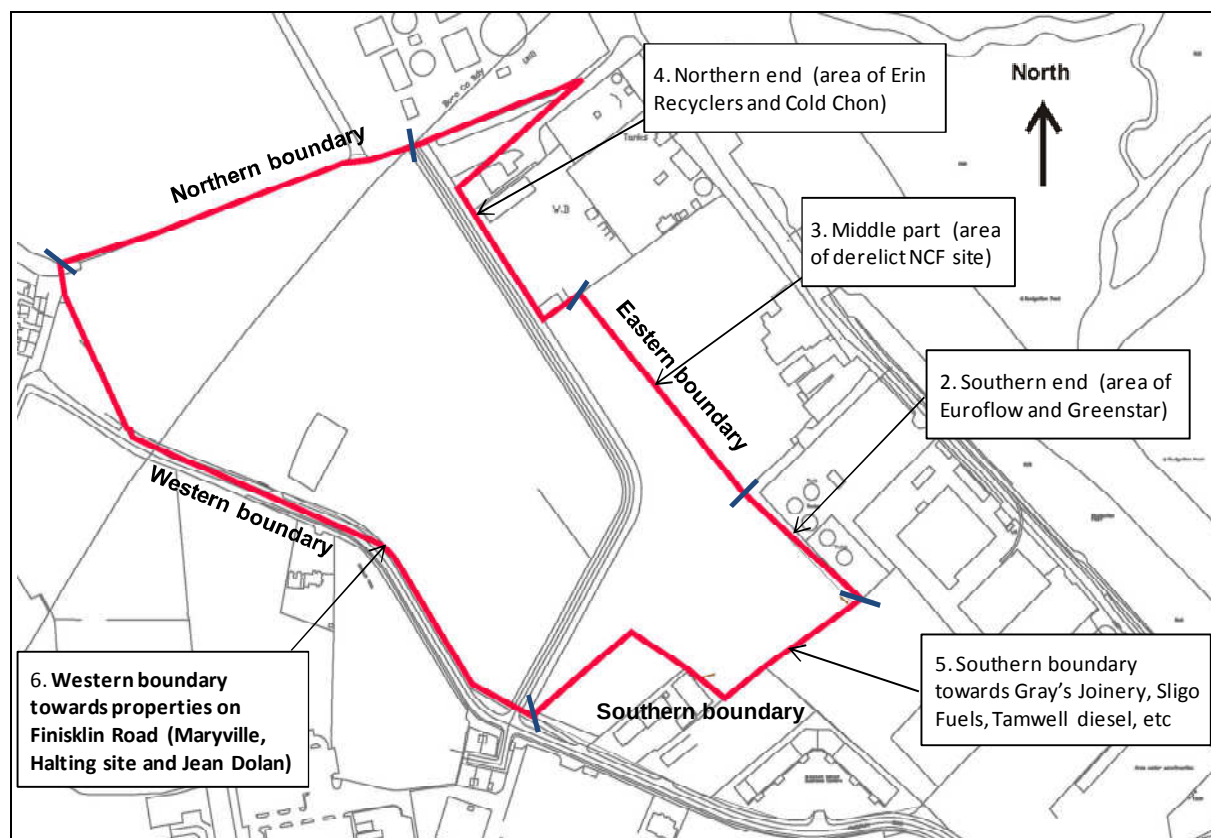


**Table 17: Risk assessment – current condition**

| Pollutant linkage                                                                                         | Estimated probability <sup>1</sup>                                                                       | Estimated consequence <sup>1</sup>                                                                                                                                                                                          | Estimated risk (combination of consequence and probability) <sup>1</sup> | Mitigation                          |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------|
| 1. Vertical migration of gas from surface to air above the former landfill and users of open space site   | Extremely unlikely in significant quantities                                                             | Negligible - the former landfill is open and there is nowhere for the gas to accumulate to levels that could cause significant harm. Any gas that is emitted from the surface will be diluted instantly, even on calm days. | Negligible risk                                                          | None required in current condition. |
| <b>Migration across Eastern boundary towards buildings on Deep Water Berths Road</b>                      |                                                                                                          |                                                                                                                                                                                                                             |                                                                          |                                     |
| 2. Gas migration into buildings off site via horizontal migration at depth followed by vertical migration | Very unlikely now - the materials are not generating large volumes of gas that can force gas through the | Severe – if gas builds up in a confined space it could cause an explosion or asphyxiation.                                                                                                                                  | Low risk                                                                 | None required in current condition. |

| Pollutant linkage                                                                                                                                                                      | Estimated probability <sup>1</sup>                                                                                                                                                               | Estimated consequence <sup>1</sup>                                                                                                                                      | Estimated risk (combination of consequence and probability) <sup>1</sup>                              | Mitigation                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| into buildings<br><b>Southern end (area of Euroflow and Greenstar)</b>                                                                                                                 | ground.                                                                                                                                                                                          |                                                                                                                                                                         |                                                                                                       |                                                                                                                                    |
| 3. Gas migration into buildings off site via horizontal migration at depth followed by vertical migration into buildings<br><b>Middle part (area of derelict NCF site)</b>             | Unlikely in mid area                                                                                                                                                                             | Substantial – if gas builds up in a confined space it could cause an explosion or asphyxiation – however the buildings are derelict and will be relatively well vented. | Low risk given that adjacent site is unoccupied and derelict (This will change if site is developed). | No buildings adjacent to site in mid area of eastern boundary – if this area is developed vent trench may be required.             |
| 4. Gas migration into buildings off site via horizontal migration at depth followed by vertical migration into buildings<br><b>Northern end (area of Erin Recyclers and Cold Chon)</b> | Fairly probable - the materials below the site are only just likely approaching end of significant generation and could be generating sufficient volume of gas to cause some migration off site. | Severe – if gas builds up in a confined space it could cause an explosion or asphyxiation.                                                                              | High risk                                                                                             | Vent trench (see recommendations for extent of trench).                                                                            |
| <b>Migration across southern boundary towards Gray's Joinery, Sligo Fuels, Tamwell diesel, etc.</b>                                                                                    |                                                                                                                                                                                                  |                                                                                                                                                                         |                                                                                                       |                                                                                                                                    |
| 5. Gas migration into buildings off site via horizontal migration at depth followed by vertical migration into buildings.                                                              | Very unlikely now - the materials below the site are not generating large volumes of gas that can force gas through the ground.                                                                  | Severe – if gas builds up in a confined space it could cause an explosion or asphyxiation.                                                                              | Low risk                                                                                              | None required in current condition.                                                                                                |
| <b>Migration across western boundary towards properties on Finisklin Road (Maryville, Halting site and Jean Dolan)</b>                                                                 |                                                                                                                                                                                                  |                                                                                                                                                                         |                                                                                                       |                                                                                                                                    |
| 6. Gas migration into buildings off site via horizontal migration at depth followed by vertical migration into buildings.                                                              | Very unlikely because of the geology – clayey soils outside the site will limit the potential for gas migration.                                                                                 | Severe – if gas builds up in a confined space it could cause an explosion or asphyxiation.                                                                              | Low risk                                                                                              | As a precaution provide vent wells along north west boundary for a short section adjacent to Jean Dolan house (see recommendations |

| Pollutant linkage                                                          | Estimated probability <sup>1</sup>                                                                                           | Estimated consequence <sup>1</sup>                                                         | Estimated risk (combination of consequence and probability) <sup>1</sup> | Mitigation                                                                   |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------|
|                                                                            |                                                                                                                              |                                                                                            |                                                                          | for extent of trench).                                                       |
| <b>Migration via preferential pathways (along buried service trenches)</b> |                                                                                                                              |                                                                                            |                                                                          |                                                                              |
| Gas migration along buried services and into buildings.                    | Very unlikely given the shallow depth and granular fill. Gas is not likely to migrate long distances in the trench backfill. | Severe – if gas builds up in a confined space it could cause an explosion or asphyxiation. | Low risk                                                                 | Advise service companies of likely presence of gas in services in this area. |

1. Based on guidance provided in CIRIA Report C665

In regards to the assessment of risk for the southern boundary (refer to point 5 in Table 17), there is no evidence of large scale migration of gas across the southern boundary. BH7 contains elevated levels of gas however there is no correlation in changes between these gas concentrations and those identified in BH23. Given that the area was progressively filled to the north, the material beyond the southern boundary is likely to be of a similar age to the waste materials identified within the southern portion of the site. This is supported by the logs that indicate similar material at both locations. Therefore it is reasonable to assume that the gas being detected beyond the site boundary is as a result of waste materials located beneath these areas as opposed to gas migrating across the southern boundary. In the event that migration does occur from the former landfill across the southern boundary it will not add significantly to the existing risk from gas that is present directly below these areas.

The estimated risk for the former landfill at Finisklin under current conditions varies from negligible to high risk in the northern portion of the site.

## 7.8 Quantitative Assessment

The estimated rate of gas generation has been used to assess the likely rate of methane emissions from within the former landfill and also outside the site. The equilibrium concentration of gas in an occupied building at distances between 25m and 100m from the landfill has also been estimated for migration beyond the northern and southern ends of the eastern boundary. Although certain assumptions had to be made in regards to historic filling operations, it is considered that the estimates that have been made are very conservative as they ignore factors such as oxidation of methane and dilution of the gas in the surface soil layers, which in practice would reduce the total emission rate of ground gas.

A number of different methods have been used to estimate the emissions and the results from all the methods are similar. They indicate that the volume of gas being generated at the present time is very low at the southern end and extremely low compared to a recent domestic landfill site. Thus the assessment indicates that at present the risk of gas migration from the southern part of the site in its current state is very low. The results of the calculations for the southern part of the site also indicate that this portion of the site is unlikely to be generating sufficient gas to cause significant gas migration off site. Estimated equilibrium gas concentrations in the industrial type building situated beyond the southern

boundary are estimated to be below 0.1% and this has been confirmed by internal monitoring.

At the northern end of the site the calculations indicate that the concentration of gas could potentially build up in excess of the acceptable concentration of 0.1% inside buildings situated beyond the site boundary that adjoins this part of the site (up to about 0.2% v/v). This demonstrates that the risk of migration off site in the northern area is greater and is consistent with the other data from the site. Monitoring has detected gas migrating into service ducts and vents below offsite buildings.

Refer to Appendix N for model printouts.

## **7.9 Summary of Gas Risk Assessment Findings**

It is concluded that the risk posed by the presence of methane and carbon dioxide from the former landfill is variable. The southern, older parts of the former landfill are a lower risk grading to the northern, more recently filled areas where a moderate to high risk exists.

There is no clear evidence that gas migration off-site is occurring along the western boundary, and given the geology (clayey soils) it is considered unlikely that widespread migration could occur for any great distance. There are also a limited number of isolated receptors along this boundary. The risk of migration beyond this boundary is considered low.

Gas migration across the eastern boundary towards the buildings on Deepwater Berths Road is unlikely in the southern part of the former landfill. However the risk increase to high towards the north as there is evidence of gas migration adjacent to the northern part of the eastern boundary (Erin Recyclers). The findings of the internal surveys indicate that there is no immediate risk to these buildings, although a potential risk does remain that the gas could accumulate within these buildings. The specific risk from the former landfill itself is complicated by the fact that waste materials i.e. gas generating materials, are located beyond the site boundary. Regardless, it is considered that there is a potential risk from the former landfill even if there are other offsite contributory sources.

The majority of gas being generated at the former landfill at present is most likely escaping through the surface, due to the shallow depth of the landfill and the composition of the landfill cap. This will not pose a significant risk to people on or around the site as the volume of gas escaping is low and will be diluted in the atmosphere. The emissions of methane do however constitute green house gas emissions, consideration of which is beyond the scope of this report. Please note, the composition of the landfill cap currently on site is facilitating the natural venting of gas to the atmosphere and the site has been assessed assuming the existing cap remains in place (although limited regrading of the cap is permitted 10% change (plus or minus) of existing/current thickness at any one location). However, it is not recommended that any further capping works are completed on site that would impair the venting process (i.e. it is not recommended to cap areas currently uncapped).

Due to the volumes of gas predicted, an active landfill gas collection system will not be required as a remedial option. A passive system (e.g. vent trench or similar) will be sufficient.

The risk of gas migration off-site and the risk to potential receptors is summarised In Table 18 for the site in its present condition.



**Table 18:** Risk of gas migration off-site and risk to potential receptors

| Boundary          | Potential for migration of landfill gas off-site                                                        | Risk to potential receptors if gas does migrate off-site                   |
|-------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Western boundary  | Very unlikely for any great distance. Possible that localised migration below Finisklin Road may occur. | Low risk                                                                   |
| Eastern boundary  | Very unlikely at southern end of this boundary increasing to fairly probable at northern end.           | Low risk at southern end and around NCF site. High risk at Erin Recyclers. |
| Southern boundary | Very unlikely                                                                                           | Low risk                                                                   |

## 7.10 Revised Site Prioritisation

The site prioritisation process was repeated following the Tier 1 and Tier 2 risk assessment process. In the current conditions the following SPR linkages remain with SPR3 the only linkage removed in this process.

**Table 19:** Revised Site Prioritisation Summary

| SPR                     | Linkages                                 | Pathway via                                                        | SPR Value | Maximum Score | Normalised Score |
|-------------------------|------------------------------------------|--------------------------------------------------------------------|-----------|---------------|------------------|
| SPR1                    | Leachate ⇨ Surface Water                 | Combined groundwater and surface water                             | 0         | 300           | 0%               |
| SPR2                    | Leachate ⇨ SWDTE                         | Combined groundwater and surface water                             | 0         | 300           | 0%               |
| SPR3                    | Leachate ⇨ Human Presence (private well) | Groundwater Pathway                                                | 0         | 240           | 0%               |
| SPR4                    | Leachate ⇨ GWDTE                         | Groundwater Pathway                                                | 0         | 240           | 0%               |
| SPR5                    | Leachate ⇨ Aquifer                       | Groundwater Pathway                                                | 90        | 400           | 22.5%            |
| SPR6                    | Leachate ⇨ Public Supply                 | Groundwater Pathway                                                | 0         | 560           | 0%               |
| SPR7                    | Leachate ⇨ Surface Water                 | Groundwater Pathway                                                | 90        | 240           | 37.5%            |
| SPR8                    | Leachate ⇨ Surface Water                 | Surface Water Pathway                                              | 60        | 60            | 100%             |
| SPR9                    | Leachate ⇨ SWDTE                         | Surface Water Pathway                                              | 60        | 60            | 100%             |
| SPR10                   | Landfill Gas ⇨ Human Presence – off-site | Lateral and Vertical                                               | 150       | 150           | 100%             |
| SPR11                   | Landfill Gas ⇨ Human Presence – onsite   | Lateral and Vertical                                               | 0         | 250           | 0%               |
| OVERALL RISK SCORE      |                                          |                                                                    | HIGH      |               |                  |
| Risk Classification     |                                          | Range of Risk Scores                                               |           |               |                  |
| HIGH Risk (Class A)     |                                          | Score greater than or equal to 70% for any individual SPR linkages |           |               |                  |
| MODERATE Risk (Class B) |                                          | Score between 40% and 70% for any individual SPR linkages          |           |               |                  |
| LOW Risk (Class C)      |                                          | Score less than 40% for any individual SPR linkages                |           |               |                  |

Sites with a score greater than or equal to 70% for any of the site specific SPR linkages are considered to represent potential high risk or high uncertainty sites. The risk classification assigned to former landfill at Finisklin is Class A and represents the intrinsic risk that the former landfill poses to the environment. The linkages of greatest concern include the risk of leachate migration to surface water and protected areas, and landfill gas migration to off-site receptors, all with normalised scores of 100% (high risk).



## 8.0 CONCLUSIONS

Based on the results of a comprehensive assessment that was undertaken by MOR in accordance with the EPA Code of Practice that included the installation of 23No. trial pits, 24No. boreholes of which 4No. were converted to groundwater wells, 6No. to gas wells and 9No. leachate/gas monitoring wells, laboratory analysis of 5No. soil, 8No. groundwater, 4No. surface water and 10No. leachate samples, the completion of 21No. gas monitoring surveys and 3No. internal surveys and the completion of risk assessments in accordance with all best practice requirements, it is reasonable to conclude the following:

- Reclamation/filling activities commenced in circa 1958 and finished in November 1994.
- Waste material was directly deposited onto existing mudflats. There was no landfill infrastructure installed during filling (e.g. gas or leachate collection systems).
- The type of waste found within the landfill is variable and includes domestic, commercial and C&D waste.
- Capping material was brought into the landfill under Waste Permits issued in July 2005.
- The area under the scope of the Code of Practice and associated regulations comprise ~13hectares.
- It would appear that historically waste materials were deposited beyond the boundary of the former landfill to the south and east. The location of the landfill boundary subject to this assessment has been confirmed by legal advisors employed by Sligo County Council.
- It is estimated from the trial pit and borehole logs that approximately 625,000 tonnes of municipal waste was accepted into the former landfill at Finisklin during its operational lifespan and that 250,000 tonnes of capping material was accepted.
- Soil sample results generally complied with the WAC for inert landfill with the exception of molybdenum, sulphate and total dissolved solids. All of these complied with the non-hazardous WAC.
- Following the risk prioritisation exercise in Tier 1 and again following the detailed quantitative risk assessment Finisklin Landfill can be categorised as a High Risk site. The linkages where risks were identified include the risk of leachate migration to surface water and protected areas and to off-site human receptors from landfill gas.
- Given that there is no landfill liner and no confining layer present there is a pathway between the leachate and the groundwater body beneath. There is also a direct pathway between the leachate and surface water seeps from the landfill. It has been calculated that based on the available assimilative capacity within the receiving water bodies that leachate at the former landfill is not impacting on these receiving water bodies. This is further supported by published reports that generally indicate there is no significant impact on the receiving water bodies associated with leachate from the former landfill. On that basis, it was considered that further assessment was not warranted.
- Both the groundwater body and the surface water seeps clearly show evidence of tidal intrusion largely influenced by its proximity to the tidal waters of the Garavogue

Estuary. Other sources of contaminants in addition to the former landfill were also identified and include the waste located beyond the landfill boundary, the former practice of discharging untreated sewage, diffuse agricultural and point source emissions from surrounding industrial and residential properties.

- It is concluded that the risk posed by the presence of methane and carbon dioxide from the former landfill is variable. The southern, older parts of the former landfill are at a lower risk grading to the northern, more recently filled areas that are at a moderate to high risk.
- The western part of the landfill is underlain by clayey soils which limit the potential for widespread gas migration from the former landfill in this area. There is a greater risk of gas migration to the south and east as the landfill material continues beyond the landfill boundary in these areas. The results from the internal survey suggest that landfill gas is migrating across the eastern boundary of the former landfill, as indicated by elevated concentrations recorded in service ducts and drains in offsite buildings, albeit there was no evidence to suggest an immediate risk to any of these buildings.
- The lack of an engineered cap means that it is likely that gas generated is venting through the capping layer in a diffuse manner and thus reducing the potential to migrate beyond the boundary.
- The findings of the Tier 2 detailed gas risk assessment established that there is the potential for gas to migrate beyond the boundary in its current condition. Therefore, remedial measures to mitigate against those risks are required (refer Section 9.0 for details).
- Given the low volumes of gas being generated it is not considered that an active landfill gas system is required rather that passive venting would be considered to be the most appropriate remediation technique.

## 9.0 RECOMMENDATIONS

Based on the findings of this assessment and as a precautionary approach considering that a potential exists that gas may be migrating offsite, the following measures are recommended:

- Along the eastern boundary (north end) a vent trench should be installed to clearly prevent any potential migration of landfill gas to offsite locations and to vent this gas in a controlled manner to the atmosphere. The vent trench should be provided in the locations shown on Figure 24. It should extend to the base of the landfill or 0.5m below the lowest likely groundwater level (probably about 5m to 6m deep). It should be between 0.6m and 1m wide and backfilled with coarse open graded aggregate (typically 40mm single size crushed rock). The gravel should incorporate a 150mm pipe that is vented to atmosphere via vent sacks or bollards at 20m centres. The length of the trench would be approximately 200m.

**Figure 24: Recommended locations for vent trenches**



- At the northern part of the western boundary, where there are adjacent receptors (Ms. Jean Dolan's house), a vent well system should also be installed as shown in Figure 24. Vent wells will be sufficient along this boundary where the risk is lower due to the topography and geology. The wells should be spaced at 5m centres and again designed to dilute gas to less than 1% v/v before discharge. The wells should be at least 300mm diameter and should have a 100mm diameter perforated pipe installed. They should extend to the base of the landfill or 0.5m below the lowest likely groundwater level (5m to 6m). They should be designed to dilute gas to an acceptable concentration (typically 1% v/v) before discharging it to atmosphere. Further investigation will be required along the exact line of the trench and wells to determine the variation in depth of landfill or groundwater (probing, boreholes or trial pits). This can be undertaken as part of the construction contract.
- All the owners of buildings along Deepwater Berths Road should be advised of the presence of gas in the ground. At the northern end all service ducts leading into all

buildings should be sealed with expanding foam inside the duct to prevent gas ingress (Cold Chon, Erin Recyclers and Calor).

- Continued internal monitoring should be undertaken in the buildings along the northern end of Deepwater Berths Road (Erin Recyclers, Cold Chon and Calor). This should be on a monthly basis for six months at which stage the data will be assessed to see if further ongoing monitoring is required. There will also be a requirement that monthly monitoring for a 3-6month period is completed following implementation of remedial works. Monitoring of the nearby wells (both inside and outside the landfill) should also be carried out at the same time.
- All Service companies should be made aware of the presence of landfill gas in the area so that suitable precautions can be taken if any works on services are required.
- A monitoring programme should be agreed with the EPA to validate that the recommended remedial works have been properly implemented. This monitoring programme should include for both on and off-site gas wells.
- If any development of the former landfill is considered in the future, a more detailed landfill gas assessment will be required, including revising the risk assessment in this report in order to address any potential landfill gas risks to future onsite occupier and also to evaluate the impact that any onsite development would have on offsite receptors. A further assessment of soil quality should also take place.
- Some regrading works of the current cap should be undertaken in conjunction with the installation of the gas venting trenches in order to remove some of the ponded sections on the site. Regrading works should be limited to a change plus or minus 10% of existing cover. It is recommended that any areas currently uncapped should not receive a capping cover.

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# Tables



Table 7: Water Level Measurements

| Measured Parameter |      | Elevation of Reference<br>(Top of Casing) | Depth to<br>Bedrock | Bedrock<br>Elevation | Screen<br>Interval | Depth to Water<br>Strike | Water Strike<br>Elevation | Total<br>Depth | Depth to<br>Water | Water<br>Level | Total<br>Depth | Depth to<br>Water | Water<br>Level | Total<br>Depth | Depth to<br>Water | Water<br>Level | Total<br>Depth | Depth to<br>Water | Water<br>Level | Total<br>Depth | Depth to<br>Water | Water<br>Level | Total<br>Depth | Depth to<br>Water | Water<br>Level |
|--------------------|------|-------------------------------------------|---------------------|----------------------|--------------------|--------------------------|---------------------------|----------------|-------------------|----------------|----------------|-------------------|----------------|----------------|-------------------|----------------|----------------|-------------------|----------------|----------------|-------------------|----------------|----------------|-------------------|----------------|
| Units              |      | maOD                                      | mbgl                | maOD                 | mbgl               | mbgl                     | maOD                      | mbtoc          | mbtoc             | maOD           | mbtoc          | mbtoc             | maOD           | mbtoc          | mbtoc             | maOD           | mbtoc          | mbtoc             | maOD           | mbtoc          | mbtoc             | maOD           | mbtoc          | mbtoc             | maOD           |
| Date Measured      |      | 23/06/2009                                | 18/06/2009          |                      |                    |                          |                           | 25/06/2009     |                   |                | 29/06/2009     |                   |                | 03/07/2009     |                   |                | 07/07/2009     |                   |                | 15/07/2009     |                   |                | 16/07/2009     |                   |                |
| Well ID            | BH1  | 5.571                                     | 8.70                | -3.13                | 11.0-14.0          | 10.00                    | -4.43                     | 14.65          | 3.73              | 1.84           | 14.51          | 3.95              | 1.62           | 14.47          | 4.19              | 1.38           | 14.47          | 3.98              | 1.59           | -              | 4.08              | 1.49           | 14.45          | 4.02              | 1.55           |
|                    | BH2  | 6.338                                     | 10.00               | -3.66                | 11.1-14.1          | 9.60                     | -3.26                     | 14.67          | 4.74              | 1.60           | 14.57          | 4.58              | 1.76           | -              | 5.06              | 1.28           | 14.50          | 4.93              | 1.41           | -              | 5.03              | 1.31           | 14.41          | 4.91              | 1.43           |
|                    | BH3  | 5.923                                     | 7.20                | -1.28                | 10.0-13.0          | 8.30                     | -2.38                     | 13.28          | 4.28              | 1.64           | 13.41          | 4.39              | 1.53           | -              | 4.42              | 1.50           | 13.40          | 4.39              | 1.53           | -              | 4.30              | 1.62           | 13.40          | 4.38              | 1.54           |
|                    | BH4  | 5.916                                     | 10.70               | -4.78                | 11.9-14.0          | 10.70                    | -4.78                     | 14.24          | 3.89              | 2.03           | 14.27          | 4.16              | 1.76           | -              | 4.25              | 1.67           | 14.20          | 4.14              | 1.78           | -              | 4.22              | 1.70           | 14.33          | 4.30              | 1.62           |
|                    | BH5  | 7.022                                     | -                   | -                    | 0.70-3.70          | -                        | -                         | 4.27           | 3.95              | 3.08           | 4.17           | 3.95              | 3.07           | 4.16           | 3.94              | 3.08           | 4.16           | 3.97              | 3.05           | -              | 4.01              | 3.01           | 4.26           | 4.00              | 3.02           |
|                    | BH6  | 4.448                                     | -                   | -                    | 2.50-5.50          | 3.50                     | 0.95                      | 4.67           | 2.95              | 1.50           | 4.73           | 2.99              | 1.46           | 4.66           | 3.02              | 1.43           | 4.65           | 2.98              | 1.47           | -              | 3.01              | 1.44           | -              | 3.01              | 1.44           |
|                    | BH7  | 6.064                                     | -                   | -                    | 1.70-3.20          | -                        | -                         | 3.57           | dry               | -              | 3.48           | dry               | -              | 3.58           | dry               | -              | 3.57           | dry               | -              | -              | dry               | -              | -              | -                 | -              |
|                    | BH8  | 4.539                                     | -                   | -                    | 0.85-1.85          | -                        | -                         | 2.22           | Dry               | -              | 2.13           | Dry               | -              | 2.215          | 2.11              | 2.43           | 2.21           | Dry               | -              | 2.22           | 2.12              | 2.42           | 2.22           | 2.13              | 2.41           |
|                    | BH9  | 4.607                                     | -                   | -                    | 0.8-1.8            | -                        | -                         | 2.05           | Dry               | -              | 1.96           | Dry               | -              | 2.045          | 1.94              | 2.67           | 2.05           | Dry               | -              | 2.05           | 1.95              | 2.66           | 2.05           | 1.94              | 2.67           |
|                    | BH10 | 5.74                                      | -                   | -                    | 2.2-2.7            | -                        | -                         | 3.11           | 2.18              | 3.56           | 3.01           | 2.23              | 3.51           | 3.085          | 2.16              | 3.58           | 3.11           | 2.14              | 3.60           | -              | 2.20              | 3.54           | -              | 2.22              | 3.52           |
|                    | BH11 | 5.442                                     | -                   | -                    | 2.0-3.0            | -                        | -                         | 3.10           | 0.91              | 4.54           | 3.00           | 2.80              | 2.64           | 3.095          | 0.73              | 4.71           | 3.09           | 1.19              | 4.25           | -              | 1.33              | 4.11           | -              | 1.53              | 3.91           |
|                    | BH13 | 5.074                                     | -                   | -                    | 1.0-2.0            | -                        | -                         | 2.00           | 1.44              | 3.63           | 2.00           | 1.52              | 3.55           | 2.085          | 1.47              | 3.60           | 2.09           | 1.40              | 3.67           | -              | 1.43              | 3.64           | -              | 1.44              | 3.63           |
|                    | BH14 | 5.683                                     | -                   | -                    | 2.3-5.3            | -                        | -                         | 5.00           | 3.40              | 2.28           | 4.89           | 3.55              | 2.13           | 4.915          | 3.45              | 2.23           | 4.89           | 3.32              | 2.36           | -              | 3.36              | 2.32           | -              | -                 | -              |
|                    | BH20 | -                                         | -                   | -                    | 1.0-5.0            | -                        | -                         | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              |
|                    | BH21 | -                                         | -                   | -                    | 1.0-5.0            | -                        | -                         | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              |
|                    | BH22 | -                                         | -                   | -                    | 0.92-3.8           | 0.80                     | -                         | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              |
|                    | BH23 | -                                         | -                   | -                    | 1.0-4.3            | 0.15 & 2.60              | -                         | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              |
|                    | BH24 | -                                         | -                   | -                    | 1.0-3.5            | 1.70                     | -                         | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              |
|                    | BH25 | -                                         | -                   | -                    | 1.0-4.0            | -                        | -                         | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              | -              | -                 | -              |

Notes:  
maOD denotes metres above ordnance datum.  
mbgl denotes metres below ground level.  
mbtoc denotes metres below top of casing.  
- denotes no data available.

Table 7: Water Level Measurements

| Measured Parameter |      | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level | Total Depth | Depth to Water | Water Level |
|--------------------|------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|
| Units              |      | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        | mbtoc       | mbtoc          | maOD        |
| Date Measured      |      | 04/03/2010  |                |             | 16/03/2010  |                |             | 15/04/2010  |                |             | 23/04/2010  |                |             | 16/06/2010  |                |             | 18/06/2010  |                |             | 22/06/2010  |                |             | 25/06/2010  |                |             |
| Well ID            | BH1  | 14.44       | 3.92           | 1.65        | 14.44       | 4.36           | 1.21        | 14.43       | 3.69           | 1.89        | 14.43       | 4.31           | 1.26        | 14.43       | 4.51           | 1.06        | -           | 4.66           | 0.91        | 14.44       | 4.89           | 0.69        | 22.94       | 4.83           | 0.75        |
|                    | BH2  | 14.39       | 4.88           | 1.46        | 14.40       | 5.12           | 1.22        | 14.40       | 4.77           | 1.57        | 14.41       | 5.04           | 1.30        | 14.33       | 5.31           | 1.03        | -           | 5.40           | 0.94        | 14.34       | 5.56           | 0.78        | 22.90       | 5.48           | 0.86        |
|                    | BH3  | 13.27       | 4.27           | 1.65        | 13.26       | 4.35           | 1.57        | 13.26       | 4.19           | 1.73        | 13.27       | 4.29           | 1.63        | -           | 4.70           | 1.22        | -           | 4.71           | 1.22        | 13.27       | 4.75           | 1.17        | 21.76       | 4.74           | 1.18        |
|                    | BH4  | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           |
|                    | BH5  | 4.16        | 3.60           | 3.42        | 4.16        | 3.56           | 3.46        | 4.16        | 3.61           | 3.41        | 4.17        | 3.74           | 3.28        | 4.16        | 3.88           | 3.14        | -           | 3.88           | 3.14        | 4.16        | 3.87           | 3.15        | 4.16        | 3.86           | 3.16        |
|                    | BH6  | 4.59        | 2.94           | 1.51        | 4.58        | 2.93           | 1.52        | 4.59        | 2.80           | 1.65        | 4.59        | 2.85           | 1.60        | 3.56        | 3.16           | 1.29        | -           | 3.15           | 1.30        | 4.60        | 3.14           | 1.31        | 4.60        | 3.15           | 1.30        |
|                    | BH7  | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | =           | -              | -           |
|                    | BH8  | 2.13        | Dry            | -           | 2.13        | Dry            | -           | 2.13        | Dry            | -           | 2.15        | Dry            | -           | 2.12        | Dry            | -           | 2.13        | Dry            | -           | 2.13        | Dry            | -           | 2.13        | Dry            | -           |
|                    | BH9  | 1.97        | Dry            | -           | 1.97        | Dry            | -           | 1.96        | Dry            | -           | 1.98        | Dry            | -           | 1.95        | Dry            | -           | 1.96        | Dry            | -           | 1.96        | Dry            | -           | 1.96        | Dry            | -           |
|                    | BH10 | 3.00        | 2.51           | 3.24        | 3.00        | 2.41           | 3.33        | 3.00        | 2.42           | 3.33        | 3.01        | 2.35           | 3.40        | -           | 2.49           | 3.25        | -           | 2.49           | 3.25        | 3.00        | 2.48           | 3.26        | 3.01        | 2.48           | 3.27        |
|                    | BH11 | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           |
|                    | BH13 | 2.01        | 1.42           | 3.65        | 2.00        | 1.49           | 3.59        | 2.01        | 1.40           | 3.68        | 2.02        | 1.48           | 3.59        | 2.01        | Dry            | -           | 2.01        | Dry            | -           | 2.00        | Dry            | -           | 2.00        | Dry            | -           |
|                    | BH14 | 4.87        | 3.50           | 2.19        | 4.89        | 3.59           | 2.09        | 4.89        | 4.35           | 1.34        | 4.90        | 3.53           | 2.15        | 4.89        | 3.77           | 1.92        | -           | 3.76           | 1.92        | 4.90        | 3.75           | 1.93        | 4.90        | 3.75           | 1.93        |
|                    | BH20 | 4.71        | 2.39           | -           | 4.67        | 2.48           | -           | 4.67        | 2.50           | -           | 4.69        | 2.57           | -           | 4.69        | 2.57           | -           | -           | 2.59           | -           | 4.70        | 2.71           | -           | 4.70        | 2.66           | -           |
|                    | BH21 | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           | -           | -              | -           |
|                    | BH22 | 3.89        | 0.96           | -           | 3.80        | 1.07           | -           | 3.82        | 0.97           | -           | 3.77        |                | -           | 3.70        | 1.35           | -           | -           | 1.36           | -           | 3.78        | 1.38           | -           | 3.76        | 1.38           | -           |
|                    | BH23 | 4.33        | 1.67           | -           | 4.32        | 1.54           | -           | 4.32        | 1.50           | -           | 4.30        | 1.53           | -           | 4.27        | 1.76           | -           | -           | 1.73           | -           | 4.29        | 1.72           | -           | 4.27        | 1.69           | -           |
|                    | BH24 | 3.37        | 1.34           | -           | 3.33        | 1.46           | -           | 3.34        | 1.38           | -           | 3.32        | 1.47           | -           | 3.30        | 1.60           | -           | -           | 1.60           | -           | 3.31        | 1.61           | -           | 3.31        | 1.60           | -           |
|                    | BH25 | 3.78        | 1.37           | -           | 3.75        | 1.56           | -           | 3.75        | 1.26           | -           | 3.73        | 1.57           | -           | -           | 1.90           | -           | -           | 1.96           | -           | 3.68        | 2.03           | -           | 3.71        | 2.05           | -           |

Notes:  
maOD denotes metres above ordnance datum.  
mbgl denotes metres below ground level.  
mbtoc denotes metres below top of casing.  
- denotes no data available.

Table 8: Soil Analytical Results

| Sample ID                               |       |       | TP3                           | TP5                           | TP7                           | TP10                          | TP16                          | Criteria and procedures for the acceptance of waste at landfills (2003/33/EC) <sup>1</sup> |                                                |                                            |
|-----------------------------------------|-------|-------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------|
| Sample Depth (mbgl)                     |       |       | 2.5-3.0                       | 4.2                           | 3.5-3.9                       | 2.1                           | 3.0-4.0                       | Criteria for landfills for inert waste                                                     | Criteria for landfills for non-hazardous waste | Criteria for landfills for hazardous waste |
| Laboratory Report No.                   |       |       | 09/1738                       | 09/1738                       | 09/1738                       | 09/1738                       | 09/1738                       |                                                                                            |                                                |                                            |
| Sample Date                             |       |       | 16/06/2009                    | 16/06/2009                    | 16/06/2009                    | 16/06/2009                    | 16/06/2009                    |                                                                                            |                                                |                                            |
| Parameters                              | Unit  | MDL   |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Total Organic Carbon (TOC)              | %     | 0.2   | 4.2                           | 11.1                          | 9.4                           | 2.1                           | 8.8                           | ~                                                                                          | 5                                              | 6                                          |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Petroleum Hydrocarbons                  |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| DRO/EPH (C8-40)                         | mg/kg | 30    | 606                           | 2,345                         | 1,752                         | 1,991                         | 799                           | ~                                                                                          | ~                                              | ~                                          |
| DRO/EPH Interpretation                  | ♦     | NA    | Naturally Occurring Compounds | Naturally Occurring Compounds | Naturally Occurring Compounds | Naturally Occurring Compounds | Naturally Occurring Compounds | ~                                                                                          | ~                                              | ~                                          |
| Mineral oil                             | mg/kg | 30    | <30                           | <30                           | <30                           | <30                           | <30                           | 500                                                                                        | ~                                              | ~                                          |
| Benzene                                 | mg/kg | 0.002 | <0.002                        | <0.002                        | <0.002                        | 0.008                         | <0.002                        | ~                                                                                          | ~                                              | ~                                          |
| Toluene                                 | mg/kg | 0.002 | 0.005                         | 0.004                         | <0.002                        | 0.278                         | <0.002                        | ~                                                                                          | ~                                              | ~                                          |
| Ethylbenzene                            | mg/kg | 0.002 | <0.002                        | 0.008                         | 0.003                         | 0.02                          | <0.002                        | ~                                                                                          | ~                                              | ~                                          |
| m/p-Xylene                              | mg/kg | 0.004 | 0.051                         | 0.076                         | 0.012                         | 0.191                         | <0.004                        | ~                                                                                          | ~                                              | ~                                          |
| o-Xylene                                | mg/kg | 0.002 | 0.014                         | 0.054                         | 0.003                         | 0.118                         | <0.002                        | ~                                                                                          | ~                                              | ~                                          |
| Total Xylenes                           | mg/kg | NA    | 0.065                         | 0.130                         | 0.015                         | 0.309                         | <0.006                        | ~                                                                                          | ~                                              | ~                                          |
| Total BTEX *                            | mg/kg | 0.012 | 0.07                          | 0.142                         | 0.018                         | 0.615                         | <0.012                        | 6                                                                                          | ~                                              | ~                                          |
| MTBE                                    | mg/kg | 0.004 | <0.004                        | <0.004                        | <0.004                        | <0.004                        | <0.004                        | ~                                                                                          | ~                                              | ~                                          |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Polycyclic Aromatic Hydrocarbons (PAHs) |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Naphthalene                             | mg/kg | 0.03  | <0.03                         | <0.15                         | <0.03                         | <0.03                         | <0.03                         | ~                                                                                          | ~                                              | ~                                          |
| Acenaphthylene                          | mg/kg | 0.02  | <0.02                         | <0.1                          | 0.1                           | 0.08                          | <0.02                         | ~                                                                                          | ~                                              | ~                                          |
| Acenaphthene                            | mg/kg | 0.02  | <0.02                         | <0.1                          | <0.02                         | 0.08                          | 0.05                          | ~                                                                                          | ~                                              | ~                                          |
| Fluorene                                | mg/kg | 0.02  | <0.02                         | <0.1                          | 0.06                          | 0.08                          | 0.05                          | ~                                                                                          | ~                                              | ~                                          |
| Phenanthrene                            | mg/kg | 0.02  | 0.18                          | 0.34                          | 0.21                          | 0.26                          | 0.14                          | ~                                                                                          | ~                                              | ~                                          |
| Anthracene                              | mg/kg | 0.02  | <0.02                         | <0.1                          | 0.07                          | 0.08                          | 0.05                          | ~                                                                                          | ~                                              | ~                                          |
| Fluoranthene                            | mg/kg | 0.02  | 0.21                          | 0.47                          | 0.53                          | 0.41                          | 0.15                          | ~                                                                                          | ~                                              | ~                                          |
| Pyrene                                  | mg/kg | 0.03  | 0.19                          | 0.4                           | 0.5                           | 0.34                          | 0.12                          | ~                                                                                          | ~                                              | ~                                          |
| Benzo(a)anthracene                      | mg/kg | 0.02  | 0.25                          | 0.52                          | 0.4                           | 0.3                           | 0.14                          | ~                                                                                          | ~                                              | ~                                          |
| Chrysene                                | mg/kg | 0.04  | 0.19                          | 0.39                          | 0.38                          | 0.22                          | 0.10                          | ~                                                                                          | ~                                              | ~                                          |
| Benzo(b) + Benzo(k) fluoranthene        | mg/kg | 0.04  | 0.35                          | 0.71                          | 0.61                          | 0.43                          | 0.20                          | ~                                                                                          | ~                                              | ~                                          |
| Benzo(a)pyrene                          | mg/kg | 0.02  | 0.16                          | 0.38                          | 0.41                          | 0.26                          | 0.12                          | ~                                                                                          | ~                                              | ~                                          |
| Indeno(123cd)pyrene                     | mg/kg | 0.02  | 0.18                          | 0.28                          | 0.3                           | 0.2                           | 0.10                          | ~                                                                                          | ~                                              | ~                                          |
| Dibenzo(ah)anthracene                   | mg/kg | 0.02  | <0.02                         | <0.1                          | <0.02                         | 0.08                          | <0.02                         | ~                                                                                          | ~                                              | ~                                          |
| Benzo(ghi)perylene                      | mg/kg | 0.04  | 0.16                          | 0.28                          | 0.31                          | 0.18                          | 0.07                          | ~                                                                                          | ~                                              | ~                                          |
| Coronene                                | mg/kg | 0.02  | 0.05                          | <0.1                          | 0.12                          | <0.02                         | <0.02                         | ~                                                                                          | ~                                              | ~                                          |
| Total 10 PAH (Dutch) <sup>#</sup>       | mg/kg | 0.27  | 1.68                          | 3.37                          | 3.22                          | 2.34                          | 1.07                          | ~                                                                                          | ~                                              | ~                                          |
| Total 17 PAHs <sup>###</sup>            | mg/kg | 0.40  | 1.92                          | 3.77                          | 4.00                          | 3.00                          | 1.29                          | ~                                                                                          | ~                                              | ~                                          |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Polychlorinated Biphenyls (PCBs)        |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| PCB Congener 28                         | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | 0.069                         | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Congener 52                         | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | 0.013                         | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Congener 101                        | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | <0.005                        | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Congener 118                        | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | <0.005                        | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Congener 138                        | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | <0.005                        | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Congener 153                        | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | <0.005                        | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Congener 180                        | mg/kg | 0.005 | <0.005                        | <0.025                        | <0.005                        | <0.005                        | <0.005                        | ~                                                                                          | ~                                              | ~                                          |
| PCB Total of 7 Congeners *              | mg/kg | 0.035 | <0.035                        | <0.175                        | <0.035                        | 0.082                         | <0.035                        | 1                                                                                          | ~                                              | ~                                          |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Gasoline Range Organic (GRO) (C4-12)    |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| GRO (C4-8)                              | mg/kg | 0.1   | 0.215                         | <0.1                          | <0.1                          | 1.282                         | 0.116                         | ~                                                                                          | ~                                              | ~                                          |
| GRO (C8-12)                             | mg/kg | 0.1   | 3.67                          | 13.978                        | 0.615                         | 46.659                        | 0.364                         | ~                                                                                          | ~                                              | ~                                          |
| GRO (C4-12)                             | mg/kg | 0.1   | 3.885                         | 13.978                        | 0.615                         | 47.941                        | 0.481                         | ~                                                                                          | ~                                              | ~                                          |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| CEN 10:1 Leachates                      |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Arsenic                                 | mg/kg | 0.01  | 0.04                          | 0.07                          | 0.04                          | 0.05                          | 0.08                          | 0.5                                                                                        | 2                                              | 25                                         |
| Barium                                  | mg/kg | 0.03  | 0.49                          | 0.85                          | 1.23                          | 0.25                          | 0.71                          | 20                                                                                         | 100                                            | 300                                        |
| Cadmium                                 | mg/kg | 0.01  | <0.01                         | <0.01                         | <0.01                         | <0.01                         | <0.01                         | 0.04                                                                                       | 1                                              | 5                                          |
| Chromium                                | mg/kg | 0.02  | 0.03                          | <0.02                         | <0.02                         | <0.02                         | <0.02                         | 0.5                                                                                        | 10                                             | 70                                         |
| Copper                                  | mg/kg | 0.12  | <0.12                         | <0.12                         | <0.12                         | <0.12                         | <0.12                         | 2                                                                                          | 50                                             | 100                                        |
| Mercury                                 | mg/kg | 0.001 | <0.001                        | <0.001                        | <0.001                        | <0.001                        | <0.001                        | 0.01                                                                                       | 0.2                                            | 2                                          |
| Molybdenum                              | mg/kg | 0.05  | 0.31                          | 0.56                          | 0.51                          | 0.17                          | 0.39                          | 0.5                                                                                        | 10                                             | 30                                         |
| Nickel                                  | mg/kg | 0.06  | 0.13                          | 0.09                          | <0.06                         | 0.06                          | <0.06                         | 0.4                                                                                        | 10                                             | 40                                         |
| Lead                                    | mg/kg | 0.1   | <0.1                          | <0.1                          | <0.1                          | <0.1                          | <0.1                          | 0.5                                                                                        | 10                                             | 50                                         |
| Antimony                                | mg/kg | 0.03  | <0.03                         | 0.03                          | <0.03                         | <0.03                         | <0.03                         | 0.06                                                                                       | 0.7                                            | 5                                          |
| Selenium                                | mg/kg | 0.03  | <0.03                         | <0.03                         | <0.03                         | <0.03                         | <0.03                         | 0.1                                                                                        | 0.5                                            | 7                                          |
| Zinc                                    | mg/kg | 0.04  | <0.04                         | <0.04                         | <0.04                         | 0.12                          | <0.04                         | 4                                                                                          | 50                                             | 200                                        |
|                                         |       |       |                               |                               |                               |                               |                               |                                                                                            |                                                |                                            |
| Dissolved Organic Carbon (DOC)          | mg/kg | 20    | 30                            | 50                            | 40                            | 40                            | 20                            | 500                                                                                        | 800                                            | 1,000                                      |
| Chloride                                | mg/kg | 1     | 138                           | 27                            | 67                            | 498                           | 82                            | 800                                                                                        | 15,000                                         | 25,000                                     |
| Fluoride                                | mg/kg | 1     | <1                            | <1                            | <1                            | <1                            | <1                            | 10                                                                                         | 150                                            | 500                                        |
| Sulphate                                | mg/kg | 1     | 172                           | 102                           | 146                           | 4,501                         | 695                           | 1,000                                                                                      | 20,000                                         | 50,000                                     |
| Total Dissolved Solids (TDS)            | mg/kg | 400   | 8,410                         | 2,070                         | 1,640                         | 2,750                         | 1,540                         | 4,000                                                                                      | 60,000                                         | 100,000                                    |
| Phenol                                  | mg/kg | 1     | <1                            | <1                            | <1                            | <1                            | <1                            | 1                                                                                          | ~                                              | ~                                          |

Notes:

1; Establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC (2003/33/EC).

**Bold** denotes parameter exceeds Waste Acceptance Criteria.

MDL denotes method detection limit.

mbgl denotes meter below ground level.

♦ denotes no unit.

NA denotes not applicable.

~ denotes no standard available.

\* denotes parameters were converted from ug/kg to mg/kg for comparison with the available standards.

<sup>#</sup> denotes PAH 10 total includes Anthracene, Benzo(a)anthracene, Benzo(k)fluoranthene, Benzo(a)pyrene, Chrysene, Phenanthrene, Fluoranthene, Indeno(123cd)pyrene, Naphthalene & Benzo(ghi)perylene.

<sup>###</sup> denotes PAH 17 total includes Anthracene, Benzo(a)anthracene, Benzo(k)fluoranthene, Benzo(a)pyrene, Chrysene, Phenanthrene, Fluoranthene, Indeno(123cd)pyrene, Naphthalene, Benzo(ghi)perylene, Acenaphthylene, Acenaphthene, Fluorene, Pyrene, Benzo(b)fluoranthene, Dibenzo(ah)anthracene & Coronene.

Table 9: Groundwater Analytical Results

| Sample ID                                        |           |      | BH1                         |                      | BH2                |            | BH3          |               | BH4                  |            | Groundwater Quality Standards                                  |                                                                | Drinking Water Standards (SI 278 of 2007) <sup>3</sup> |
|--------------------------------------------------|-----------|------|-----------------------------|----------------------|--------------------|------------|--------------|---------------|----------------------|------------|----------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------|
| Laboratory Report No.                            |           |      | 09/1801                     | 09/2082              | 09/1801            | 09/2082    | 09/1801      | 09/2082       | 09/1801              | 09/2082    | Groundwater Regulations 2010 (S.I. No. 9 of 2010) <sup>1</sup> | EPA Interim Guideline Value (IGV) for Groundwater <sup>2</sup> |                                                        |
| Sample Date                                      |           |      | 25/06/2009                  | 16/07/2009           | 25/06/2009         | 16/07/2009 | 25/06/2009   | 16/07/2009    | 25/06/2009           | 16/07/2009 |                                                                |                                                                |                                                        |
| Field Parameters                                 | Unit      | MDL  |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| pH                                               | pH units  | ♦    | 6.78                        | 7.47                 | 7.02               | 7.21       | 7.29         | 7.35          | 6.8                  | 6.92       | ~                                                              | 6.5-9.5                                                        | 6.5-9.5                                                |
| Electrical Conductivity (EC)                     | µS/cm     | ♦    | 822                         | 934                  | 2,859              | 2,520      | 5,410        | 4,710         | 1,745                | 1,662      | 800 / 1,875 <sup>#</sup>                                       | 1,000                                                          | 2,500                                                  |
| Temperature                                      | °C        | ♦    | 11.9                        | 13.1                 | 12.2               | 13         | 12.8         | 11.9          | 13.5                 | 14.1       | ~                                                              | 25                                                             | ~                                                      |
| Dissolved Oxygen (DO)                            | %         | ♦    | -                           | 55.7                 | -                  | 40.6       | -            | 4             | -                    | 35.4       | ~                                                              | NAC                                                            | ~                                                      |
| Total Dissolved Solids (TDS)                     | ppm       | ♦    | 411                         | 468                  | 1,430              | 1,260      | 2,710        | 2,600         | 874                  | 830        | ~                                                              | 1,000                                                          | ~                                                      |
| Sodium Chloride (NaCl)                           | %         | ♦    | 1.4                         | 1.6                  | 5.5                | 4.9        | 10.1         | 9.8           | 3.4                  | 3          | ~                                                              | ~                                                              | ~                                                      |
| Oxidation Reduction Potential (ORP)              | mV        | ♦    | 95                          | -27                  | -133               | 103        | -85          | -125          | -109                 | 111        | ~                                                              | ~                                                              | ~                                                      |
| Colour                                           | N/A       | ♦    | Slightly cloudy brown/ grey | Slightly cloudy/grey | Cloudy brown/ grey | -          | Cloudy brown | Cloudy yellow | Slightly cloudy grey | Clear      | ~                                                              | NAC                                                            | ATC and NAC                                            |
| Odour / Other observations                       | N/A       | ♦    | None                        | None                 | None               | -          | Silty        | None          | None                 | None       | ~                                                              | ~                                                              | ATC and NAC                                            |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Laboratory Parameters                            |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Sulphate                                         | mg/l      | 0.05 | 39.61                       | 40.39                | 86.29              | 94.71      | 0.09         | 57.26         | 1.91                 | 1.16       | 187.5                                                          | 200                                                            | 250                                                    |
| Chloride                                         | mg/l      | 0.3  | 40.5                        | 42.8                 | 469.7              | 457.1      | 777.30       | 788.80        | 114.70               | 122.20     | 24 / 187.5 <sup>#</sup>                                        | 30                                                             | 250                                                    |
| Fluoride                                         | mg/l      | 0.3  | <0.3                        | <0.3                 | 0.4                | 0.4        | 0.60         | 0.50          | <0.3                 | <0.3       | ~                                                              | 1                                                              | 0.8                                                    |
| Ammonia as N (NH <sub>4</sub> +NH <sub>3</sub> ) | mg/l      | 0.1  | <0.1                        | 0.4                  | 1.6                | 22.1       | 15.0         | 75.90         | 5.5                  | 31.10      | 0.065 / 0.175 <sup>##</sup>                                    | 0.12 *                                                         | 0.23 *                                                 |
| Total Oxidised Nitrogen as N                     | mg/l      | 0.05 | 0.36                        | 0.43                 | <0.05              | <0.05      | <0.05        | <0.05         | 0.06                 | <0.05      | ~                                                              | NAC                                                            | ~                                                      |
| Molybdate Reactive Phosphuros (MRP)              | µg/l      | 5    | 7                           | 57                   | 31                 | 290        | 84           | 405           | 32                   | 330        | 35                                                             | ~                                                              | ~                                                      |
| Total Dissolved Solids (TDS)                     | mg/l      | 35   | 407                         | 408                  | 1,531              | 1,571      | 2,871        | 2,745         | 1,690                | 742        | ~                                                              | 1,000                                                          | ~                                                      |
| Total Alkalinity as CaCO <sub>3</sub>            | mg/l      | 1    | 416                         | 268                  | 1,364              | 800        | 1,920        | 1,685         | 716                  | 608        | ~                                                              | NAC                                                            | ~                                                      |
| Total Organic Carbon (TOC)                       | mg/l      | 2    | <2                          | <2                   | <2                 | <2         | <2           | 12            | <2                   | <2         | ~                                                              | NAC                                                            | NAC                                                    |
| Total Cyanide                                    | µg/l      | 40   | <40                         | <40                  | <40                | <40        | <40          | <40           | <40                  | <40        | 37.5                                                           | 10                                                             | 50                                                     |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Microbiological                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Total Coliforms                                  | cfu/100ml | 0    | >1,000                      | >1,000               | >1,000             | >1,000     | >1,000       | >1,000        | >1,000               | >1,000     | ~                                                              | 0                                                              | 0                                                      |
| Faecal Coliforms                                 | cfu/100ml | 0    | >1,000                      | >1,000               | >1,000             | >1,000     | >1,000       | 0             | >1,000               | 0          | ~                                                              | 0                                                              | 0                                                      |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Metals (Total)                                   |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Mercury                                          | µg/l      | 1    | <1                          | <1                   | <1                 | <1         | <1           | <1            | <1                   | <1         | 0.75 "                                                         | 1                                                              | 1                                                      |
| Boron                                            | µg/l      | 12   | 42                          | 70                   | 1,223              | 1,353      | 2,279        | 2,471         | 473                  | 535        | 750 "                                                          | 1,000                                                          | 1,000                                                  |
| Arsenic                                          | µg/l      | 2.5  | <2.5                        | <2.5                 | 3.5                | 13.5       | 7.7          | 8             | 4                    | 9.3        | 7.5 "                                                          | 10                                                             | 10                                                     |
| Zinc                                             | µg/l      | 3    | 4                           | 12                   | 5                  | 28         | 6            | 18            | 5                    | 9          | ~                                                              | 100                                                            | ~                                                      |
| Lead                                             | µg/l      | 5    | <5                          | <5                   | <5                 | 5          | <5           | <5            | 5                    | <5         | 18.75 "                                                        | 10                                                             | 25                                                     |
| Nickel                                           | µg/l      | 2    | 3                           | 6                    | 6                  | 10         | 16           | 9             | 5                    | <2         | 15 "                                                           | 20                                                             | 20                                                     |
| Copper                                           | µg/l      | 7    | <7                          | 9                    | <7                 | 8          | <7           | 33            | <7                   | <7         | 1,500 "                                                        | 30                                                             | 2,000                                                  |
| Chromium                                         | µg/l      | 1.5  | 2.0                         | <1.5                 | 1.8                | 4.0        | 2.7          | 4.5           | 1.8                  | 5.7        | 37.5 "                                                         | 30                                                             | 50                                                     |
| Cadmium                                          | µg/l      | 0.5  | <0.5                        | <0.5                 | <0.5               | <0.5       | <0.5         | <0.5          | <0.5                 | 0.7        | 3.75 "                                                         | 5                                                              | 5                                                      |
| Manganese                                        | µg/l      | 2    | 17                          | 100                  | 278                | 462        | 131          | 533           | 504                  | 617        | ~                                                              | 50                                                             | 50                                                     |
| Iron                                             | µg/l      | 20   | 31                          | 273                  | 127                | 9,278      | 116          | 11,630        | 152                  | 21,240     | ~                                                              | 200                                                            | 200                                                    |
| Potassium                                        | mg/l      | 0.04 | 5.40                        | 4.66                 | 58.11              | 44.53      | 183.2        | 119.1         | 30.58                | 23.55      | ~                                                              | 5                                                              | ~                                                      |
| Sodium                                           | mg/l      | 0.15 | 31.85                       | 31.66                | 477.80             | 388        | 756.4        | 633.4         | 108.9                | 85.17      | 150                                                            | 150                                                            | 200                                                    |
| Calcium                                          | mg/l      | 0.03 | 137.80                      | 127.70               | 75.36              | 83.26      | 41.78        | 58.6          | 144.7                | 125.4      | ~                                                              | 200                                                            | ~                                                      |
| Magnesium                                        | mg/l      | 0.02 | 10.83                       | 11.64                | 60.14              | 49.59      | 136.2        | 101.6         | 43.29                | 37.03      | ~                                                              | 50                                                             | ~                                                      |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Pesticides                                       |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Atrazine                                         | µg/l      | 1    | <1                          | <1                   | <1                 | <1         | <1           | <1            | <1                   | <1         | 0.075                                                          | 1                                                              | 0.1                                                    |
| Simazine                                         | µg/l      | 1    | <1                          | <1                   | <1                 | <1         | <1           | <1            | <1                   | <1         | 0.075                                                          | 1                                                              | 0.1                                                    |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Semi-Volatile organic compounds (SVOCs)          |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Phenols                                          |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| 2-Chlorophenol                                   | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 200                                                            | ~                                                      |
| 2-Methylphenol                                   | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2-Nitrophenol                                    | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2,4-Dichlorophenol                               | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2,4-Dimethylphenol                               | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2,4,5-Trichlorophenol                            | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2,4,6-Trichlorophenol                            | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 200                                                            | ~                                                      |
| 4-Chloro-3-methylphenol                          | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 4-Methylphenol                                   | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 4-Nitrophenol                                    | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Pentachlorophenol                                | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 2                                                              | ~                                                      |
| Phenol                                           | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 0.5 <sup>◊</sup>                                               | ~                                                      |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| PAHs                                             |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| 2-Chloronaphthalene                              | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2-Methylnaphthalene                              | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Naphthalene                                      | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 1                                                              | ~                                                      |
| Acenaphthylene                                   | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Acenaphthene                                     | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Fluorene                                         | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Phenanthrene                                     | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Anthracene                                       | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 10,000                                                         | ~                                                      |
| Fluoranthene                                     | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 1                                                              | ~                                                      |
| Pyrene                                           | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Benz(a)anthracene                                | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Chrysene                                         | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Benzo(bjk)fluoranthene                           | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | 0.075 <sup>4</sup>                                             | 0.55 <sup>7</sup>                                              | 0.1 <sup>4</sup>                                       |
| Benzo(a)pyrene                                   | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | 0.0075                                                         | 0.01                                                           | 0.01                                                   |
| Indeno(123cd)pyrene                              | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | 0.075 <sup>4</sup>                                             | 0.05                                                           | 0.1 <sup>4</sup>                                       |
| Dibenzo(ah)anthracene                            | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Benzo(ghi)perylene                               | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | 0.075 <sup>4</sup>                                             | 0.05                                                           | 0.1 <sup>4</sup>                                       |
|                                                  |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Phthalates                                       |           |      |                             |                      |                    |            |              |               |                      |            |                                                                |                                                                |                                                        |
| Bis(2-ethylhexyl) phthalate                      | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | 8                                                              | ~                                                      |
| Butylbenzyl phthalate                            | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <10                  | <10        | ~                                                              | ~                                                              | ~                                                      |
| Di-n-butyl phthalate                             | µg/ l     | 10   | <10                         | <10                  | <10                | <10        | <10          | <10           | <1                   |            |                                                                |                                                                |                                                        |

Notes:

*Italics* denotes value exceeds drinking water standards.

**Bold** denotes value exceeds groundwater regulations or IGV where no groundwater regulation is available.

MDL denotes method detection limit.

ND denotes not detected. The TICs compounds reported have an minimum of 80 % certainty of being present.

♦ denotes no method detection limit.

- denotes parameter not analysed/ recorded.

~ denotes groundwater quality standard unavailable.

" denotes groundwater regulations are for dissolved metals.

◊ denotes standard relates to phenols.

# denotes lower value - assessment for the presence of saline/other intrusion; higher value - assessment of the general quality of groundwater in terms of whether its ability to support human uses has been significantly impaired by pollution.

## denotes lower value - assessment of adverse impacts of chemical inputs from groundwater on associated surface water bodies; higher value - assessment of the general quality of groundwater in terms of whether its ability to support human uses has been significantly impaired by pollution.

\* denotes standards converted from ammonium (NH4) to ammonia as N (=14/18).

\*\* denotes standard is for total xylenes.

1: European Communities Environmental Objectives (Groundwater) Regulations 2010; S.I. No. 9 of 2010.

2: Environmental Protection Agency (EPA), 2003. Towards Setting Guideline Values for the Protection of Groundwater in Ireland - Interim Report. EPA, Ireland.

3: SI No. 278 of 2007; European communities (Drinking Water) (No. 2) Regulation 2007.

4: Denotes regulation value is for "Total Polycyclic Aromatic Hydrocarbons", sum of 4 (Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(123cd)pyrene & Benzo(ghi)perylene).

5: Denotes regulation value is for "Total Trihalomethanes".

6: Denotes regulation value is for "Total Tetrachloroethene and Trichloroethene".

7: Denotes groundwater quality standard is the sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene.

Malone O'Regan

Table 9: Groundwater Analytical Results

| Sample ID                         |      |     | BH1        |            | BH2        |            | BH3        |            | BH4        |            | Groundwater Quality Standards                                  |                                                                | Drinking Water Standards (SI 278 of 2007) <sup>3</sup> |
|-----------------------------------|------|-----|------------|------------|------------|------------|------------|------------|------------|------------|----------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------|
| Laboratory Report No.             |      |     | 09/1801    | 09/2082    | 09/1801    | 09/2082    | 09/1801    | 09/2082    | 09/1801    | 09/2082    | Groundwater Regulations 2010 (S.I. No. 9 of 2010) <sup>1</sup> | EPA Interim Guideline Value (IGV) for Groundwater <sup>2</sup> |                                                        |
| Sample Date                       |      |     | 25/06/2009 | 16/07/2009 | 25/06/2009 | 16/07/2009 | 25/06/2009 | 16/07/2009 | 25/06/2009 | 16/07/2009 |                                                                |                                                                |                                                        |
| Laboratory Parameters             | Unit | MDL |            |            |            |            |            |            |            |            |                                                                |                                                                |                                                        |
| Additional SVOCs                  |      |     |            |            |            |            |            |            |            |            |                                                                |                                                                |                                                        |
| SVOC TICs (trace organics)        | µg/l | 100 | ND         | ND         | ND         | ND         | ND         | ND         | ND         | ND         | ~                                                              | ~                                                              | ~                                                      |
| 1,2-Dichlorobenzene               | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | 10                                                             | ~                                                      |
| 1,2,4-Trichlorobenzene            | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | 0.4                                                            | ~                                                      |
| 1,3-Dichlorobenzene               | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 1,4-Dichlorobenzene               | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2-Nitroaniline                    | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2,4-Dinitrotoluene                | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 2,6-Dinitrotoluene                | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 3-Nitroaniline                    | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 4-Bromophenylphenylether          | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 4-Chloroaniline                   | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 4-Chlorophenylphenylether         | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| 4-Nitroaniline                    | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Azobenzene                        | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Bis(2-chloroethoxy)methane        | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Bis(2-chloroethyl)ether           | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Carbazole                         | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Dibenzofuran                      | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Hexachlorobenzene                 | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | 0.03                                                           | ~                                                      |
| Hexachlorobutadiene               | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | 0.1                                                            | ~                                                      |
| Hexachlorocyclopentadiene         | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Hexachloroethane                  | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Isophorone                        | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| N-nitrosodi-n-propylamine         | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | ~                                                              | ~                                                      |
| Nitrobenzene                      | µg/l | 10  | <10        | <10        | <10        | <10        | <10        | <10        | <10        | <10        | ~                                                              | 10                                                             | ~                                                      |
|                                   |      |     |            |            |            |            |            |            |            |            |                                                                |                                                                |                                                        |
| Volatile organic compounds (VOCs) |      |     |            |            |            |            |            |            |            |            |                                                                |                                                                |                                                        |
| VOCs TICs (trace organics)        | µg/l | 100 | ND         | ND         | ND         | ND         | ND         | ND         | ND         | ND         | ~                                                              | ~                                                              | ~                                                      |
| Dichlorodifluoromethane           | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Methyl Tertiary Butyl Ether       | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | 30                                                             | ~                                                      |
| Chloromethane                     | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| Vinyl Chloride                    | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | 0.375                                                          | ~                                                              | 0.5                                                    |
| Bromomethane                      | µg/l | 1   | <1         | <1         | <1         | <1         | <1         | <1         | <1         | <1         | ~                                                              | ~                                                              | ~                                                      |
| Chloroethane                      | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| Trichlorofluoromethane            | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,1-Dichloroethene                | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 30                                                             | ~                                                      |
| Dichloromethane                   | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 10                                                             | ~                                                      |
| trans-1-2-Dichloroethene          | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,1-Dichloroethane                | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| cis-1-2-Dichloroethene            | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 2,2-Dichloropropane               | µg/l | 1   | <1         | <1         | <1         | <1         | <1         | <1         | <1         | <1         | ~                                                              | ~                                                              | ~                                                      |
| Bromochloromethane                | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Chloroform                        | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | 75 <sup>5</sup>                                                | 12                                                             | 100 <sup>5</sup>                                       |
| 1,1,1-Trichloroethane             | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 500                                                            | ~                                                      |
| 1,1-Dichloropropene               | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| Carbon tetrachloride              | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | 2                                                              | ~                                                      |
| 1,2-Dichloroethane                | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | 2.25                                                           | 3                                                              | 3                                                      |
| Benzene                           | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | 0.75                                                           | 1                                                              | 1                                                      |
| Trichloroethene                   | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | 7.5 <sup>6</sup>                                               | 10                                                             | 10 <sup>6</sup>                                        |
| 1,2-Dichloropropane               | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Dibromomethane                    | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| Bromodichloromethane              | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | 75 <sup>5</sup>                                                | ~                                                              | 100 <sup>5</sup>                                       |
| cis-1-3-Dichloropropene           | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Toluene                           | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 10                                                             | ~                                                      |
| trans-1-3-Dichloropropene         | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| 1,1,2-Trichloroethane             | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Tetrachloroethene                 | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | 7.5 <sup>6</sup>                                               | 10                                                             | 10 <sup>6</sup>                                        |
| 1,3-Dichloropropane               | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Dibromochloromethane              | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | 75 <sup>5</sup>                                                | ~                                                              | 100 <sup>5</sup>                                       |
| 1,2-Dibromoethane                 | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Chlorobenzene                     | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | 1                                                              | ~                                                      |
| 1,1,1,2-Tetrachloroethane         | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Ethylbenzene                      | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 10                                                             | ~                                                      |
| p/m-Xylene                        | µg/l | 5   | <5         | <5         | <5         | <5         | <5         | <5         | <5         | <5         | ~                                                              | 10 <sup>**</sup>                                               | ~                                                      |
| o-Xylene                          | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 10 <sup>**</sup>                                               | ~                                                      |
| Styrene                           | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| Bromoform                         | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | 75 <sup>5</sup>                                                | ~                                                              | 100 <sup>5</sup>                                       |
| Isopropylbenzene                  | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,1,2,2-Tetrachloroethane         | µg/l | 4   | <4         | <4         | <4         | <4         | <4         | <4         | <4         | <4         | ~                                                              | ~                                                              | ~                                                      |
| Bromobenzene                      | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         | ~                                                              | ~                                                              | ~                                                      |
| 1,2,3-Trichloropropane            | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| Propylbenzene                     | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 2-Chlorotoluene                   | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,3,5-Trimethylbenzene            | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 4-Chlorotoluene                   | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| tert-Butylbenzene                 | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,2,4-Trimethylbenzene            | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| sec-Butylbenzene                  | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 4-Isopropyltoluene                | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,3-Dichlorobenzene               | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,4-Dichlorobenzene               | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| n-Butylbenzene                    | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | ~                                                              | ~                                                      |
| 1,2-Dichlorobenzene               | µg/l | 3   | <3         | <3         | <3         | <3         | <3         | <3         | <3         | <3         | ~                                                              | 10                                                             | ~                                                      |
| 1,2-Dibromo-3-chloropropane       | µg/l | 2   | <2         | <2         | <2         | <2         | <2         | <2         | <2         | <2         |                                                                |                                                                |                                                        |

Notes:

*Italics* denotes value exceeds drinking water standards.

**Bold** denotes value exceeds groundwater regulations or IGV where no groundwater regulation is available.

MDL denotes method detection limit.

ND denotes not detected. The TICs compounds reported have an minimum of 80 % certainty of being present.

♦ denotes no method detection limit.

- denotes parameter not analysed/ recorded.

~ denotes groundwater quality standard unavailable.

" denotes groundwater regulations are for dissolved metals.

◇ denotes standard relates to phenols.

# denotes lower value - assessment for the presence of saline/other intrusion; higher value - assessment of the general quality of groundwater in terms of whether its ability to support human uses has been significantly impaired by pollution.

## denotes lower value - assessment of adverse impacts of chemical inputs from groundwater on associated surface water bodies; higher value - assessment of the general quality of groundwater in terms of whether its ability to support human uses has been significantly impaired by pollution.

\* denotes standards converted from ammonium (NH4) to ammonia as N (=14/18).

\*\* denotes standard is for total xylenes.

1: European Communities Environmental Objectives (Groundwater) Regulations 2010; S.I. No. 9 of 2010.

2: Environmental Protection Agency (EPA), 2003. Towards Setting Guideline Values for the Protection of Groundwater in Ireland - Interim Report. EPA, Ireland.

3: SI No. 278 of 2007; European communities (Drinking Water) (No. 2) Regulation 2007.

4: Denotes regulation value is for "Total Polycyclic Aromatic Hydrocarbons", sum of 4 (Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(123cd)pyrene & Benzo(ghi)perylene).

5: Denotes regulation value is for "Total Trihalomethanes".

6: Denotes regulation value is for "Total Tetrachloroethene and Trichloroethene".

7: Denotes groundwater quality standard is the sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene.

Table 10: Leachate Analytical Results

| Sample ID                           |          |       | BH6                          |                               | BH10              |                 | BH11              |                                              | BH13       |                  | BH14              |                     | EPA Landfill Manual - Leachate Management <sup>1</sup> |         |                                         |         |
|-------------------------------------|----------|-------|------------------------------|-------------------------------|-------------------|-----------------|-------------------|----------------------------------------------|------------|------------------|-------------------|---------------------|--------------------------------------------------------|---------|-----------------------------------------|---------|
| Laboratory Report No.               |          |       | 09/1801                      | 09/2082                       | 09/1801           | 09/2082         | 09/1801           | 09/2082                                      | 09/1801    | 09/2082          | 09/1801           | 09/2082             | Acetogenic Leachates<br>(Table 7.1 )                   |         | Methanogenic Leachates<br>(Table 7.1 2) |         |
| Sample Date                         |          |       | 25/06/2009                   | 16/07/2009                    | 25/06/2009        | 16/07/2009      | 25/06/2009        | 16/07/2009                                   | 25/06/2009 | 16/07/2009       | 25/06/2009        | 15/07/2009          | Minimum                                                | Maximum | Minimum                                 | Maximum |
| Field Parameters                    | Unit     | MDL   |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| pH                                  | pH units | ♦     | 6.94                         | 7.12                          | 7.33              | 7.11            | 7.27              | 7.29                                         | 6.85       | 9.96             | 7.13              | 6.82                | 5.12                                                   | 7.8     | 6.8                                     | 8.2     |
| Electrical Conductivity (EC)        | µS/cm    | ♦     | 2,634                        | 2,310                         | 1,861             | 2,566           | 789               | 591                                          | 2,726      | 2,512            | 1,076             | 1,139               | 5,800                                                  | 52,000  | 5,990                                   | 19,300  |
| Temperature                         | °C       | ♦     | 13.7                         | 12.8                          | 15.4              | 14.5            | 14.2              | 16.3                                         | 15.8       | 15.8             | 12.8              | 12.8                | ~                                                      | ~       | ~                                       | ~       |
| Dissolved Oxygen (DO)               | %        | ♦     | -                            | 12.7                          | -                 | 5.1             | -                 | 30.1                                         | -          | 25.2             | -                 | 18.4                | ~                                                      | ~       | ~                                       | ~       |
| Total Dissolved Solids (TDS)        | ppm      | ♦     | 1,328                        | 1,152                         | 931               | 1,262           | 393               | 295                                          | 1,364      | 1,254            | 539               | 569                 | ~                                                      | ~       | ~                                       | ~       |
| Sodium Chloride (NaCl)              | %        | ♦     | 5.2                          | 4.3                           | 3.6               | 4.8             | 1.4               | 1                                            | 5          | 4.6              | 1.8               | 2.1                 | ~                                                      | ~       | ~                                       | ~       |
| Oxidation Reduction Potential (ORP) | mV       | ♦     | -108                         | -112                          | -122              | 136             | -94               | -55                                          | -108       | -141             | -129              | -132                | ~                                                      | ~       | ~                                       | ~       |
| Colour                              | N/A      | ♦     | Dark black                   | Dark black (top 10cm - clear) | Dark cloudy brown | Dark grey black | Dark cloudy brown | 0-50cm clear<br>>50cm orange brown particles | Dark brown | Cloudy dark grey | Dark brown/ black | Orange brown colour | ~                                                      | ~       | ~                                       | ~       |
| Odour / Other observations          | N/A      | ♦     | Chemical odour, slight sheen | -                             | None              | Slight sheen    | Slight sheen      | None                                         | None       | Silty            | Slight sheen      | Metallic Odour      | ~                                                      | ~       | ~                                       | ~       |
|                                     |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Laboratory Parameters               |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Sulphate                            | mg/l     | <0.05 | 114.91                       | 82.70                         | -                 | -               | 41.09             | 62.57                                        | -          | -                | 6.54              | 1.05                | <5                                                     | 1560    | <5                                      | 322     |
| Chloride                            | mg/l     | <0.3  | 101.90                       | 82.30                         | -                 | -               | 19.60             | 14.40                                        | -          | -                | 25.90             | 21.40               | 659                                                    | 4670    | 570                                     | 4710    |
| Fluoride                            | mg/l     | <0.3  | <0.3                         | <0.3                          | -                 | -               | <0.3              | <0.3                                         | -          | -                | <0.3              | <0.3                | ~                                                      | ~       | ~                                       | ~       |
| Ammonia as N                        | mg/l     | <0.1  | 17.40                        | 62.40                         | -                 | -               | 1.30              | 0.50                                         | -          | -                | 0.10              | 8.70                | 194                                                    | 3610    | 283                                     | 2040    |
| Total Oxidised Nitrogen as N        | mg/l     | <0.05 | <0.05                        | <0.05                         | -                 | -               | 0.18              | 0.31                                         | -          | -                | <0.05             | <0.05               | ~                                                      | ~       | ~                                       | ~       |
| Molybdate Reactive Phosphuros (MRP) | µg/l     | <5    | 110                          | 672                           | -                 | -               | 47                | 416                                          | -          | -                | 29                | 1,032               | ~                                                      | ~       | ~                                       | ~       |
| Total Cyanide                       | µg/l     | <40   | <40                          | <40                           | -                 | -               | <40               | <40                                          | -          | -                | <40               | <40                 | ~                                                      | ~       | ~                                       | ~       |
| Biochemical Oxygen Demand (BOD)     | mg/l     | 1     | 125.5                        | 42                            | -                 | -               | -                 | 6                                            | 96.83      | -                | 19                | 48                  | 2000                                                   | 68000   | 97                                      | 1770    |
| Chemical Oxygen Demand (COD)        | mg/l     | 7     | 2,670                        | 73                            | -                 | -               | -                 | 14                                           | 2,540      | -                | 180               | 25                  | 2740                                                   | 152000  | 622                                     | 8000    |
|                                     |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Metals                              |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Mercury - total                     | µg/l     | <1    | <1                           | <1                            | -                 | -               | <1                | <1                                           | -          | -                | <1                | <1                  | <0.1                                                   | 1.5     | <0.1                                    | 0.8     |
| Boron - total                       | µg/l     | <12   | 480                          | 461                           | -                 | -               | 85                | 98                                           | -          | -                | 77                | <12                 | ~                                                      | ~       | ~                                       | ~       |
| Arsenic - total                     | µg/l     | <2.5  | 4.9                          | 8.5                           | -                 | -               | <2.5              | 2.9                                          | -          | -                | <2.5              | 30.0                | <1                                                     | 148     | <1                                      | 485     |
| Zinc - total                        | µg/l     | <3    | 6                            | 362                           | -                 | -               | 17                | 54                                           | -          | -                | 4                 | 101                 | 90                                                     | 140000  | 30                                      | 6700    |
| Lead - total                        | µg/l     | <5    | 6                            | 84                            | -                 | -               | <5                | 9                                            | -          | -                | 5                 | 60                  | <40                                                    | 650     | <40                                     | 1900    |
| Nickel - total                      | µg/l     | <2    | 8                            | 26                            | -                 | -               | 9                 | 4                                            | -          | -                | 4                 | 8                   | <30                                                    | 1870    | <30                                     | 600     |
| Copper - total                      | µg/l     | <7    | <7                           | 43                            | -                 | -               | 8                 | 26                                           | -          | -                | <7                | 35                  | 20                                                     | 1,100   | <20                                     | 620     |
| Chromium - total                    | µg/l     | <1.5  | 2.7                          | 18.9                          | -                 | -               | <1.5              | 2.8                                          | -          | -                | 3                 | 36.3                | 30                                                     | 300     | <30                                     | 560     |
| Cadmium - total                     | µg/l     | <0.5  | <0.5                         | 1.6                           | -                 | -               | <0.5              | <0.5                                         | -          | -                | <0.5              | 6.3                 | <10                                                    | 100     | <10                                     | 80      |
| Manganese - total                   | µg/l     | <2    | 1,061                        | 1,754                         | -                 | -               | 1,477             | 344                                          | -          | -                | 1,140             | 1,693               | 1400                                                   | 164000  | 40                                      | 3590    |
| Iron - total                        | µg/l     | <20   | 2,284                        | 19,920                        | -                 | -               | 239               | 5,539                                        | -          | -                | 433               | 129,500             | 48300                                                  | 2300000 | 1600                                    | 160000  |
| Potassium - total                   | mg/l     | <0.04 | 66.09                        | 47.76                         | -                 | -               | 4.28              | 2.33                                         | -          | -                | 10.34             | 8.92                | 350                                                    | 3100    | 100                                     | 1580    |
| Sodium - total                      | mg/l     | <0.15 | 113.50                       | 74.11                         | -                 | -               | 16.40             | 10.24                                        | -          | -                | 19.41             | 14.41               | 474                                                    | 2400    | 474                                     | 3650    |
| Calcium - total                     | mg/l     | <0.03 | 267.50                       | 251.00                        | -                 | -               | 138.60            | 108.00                                       | -          | -                | 167.40            | 178.10              | 270                                                    | 6240    | 23                                      | 501     |
| Magnesium - total                   | mg/l     | <0.02 | 71.40                        | 61.62                         | -                 | -               | 10.47             | 7.28                                         | -          | -                | 9.84              | 10.32               | 25                                                     | 820     | 40                                      | 1580    |
|                                     |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Pesticides                          |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Atrazine                            | µg/l     | <1    | <1                           | <1                            | -                 | -               | <1                | <1                                           | -          | -                | <1                | <1                  | ~                                                      | ~       | ~                                       | ~       |
| Simazine                            | µg/l     | <1    | <1                           | <1                            | -                 | -               | <1                | <1                                           | -          | -                | <1                | <1                  | ~                                                      | ~       | ~                                       | ~       |
|                                     |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Phenols                             |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| 2-Chlorophenol                      | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2-Methylphenol                      | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2-Nitrophenol                       | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2,4-Dichlorophenol                  | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2,4-Dimethylphenol                  | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2,4,5-Trichlorophenol               | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2,4,6-Trichlorophenol               | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 4-Chloro-3-methylphenol             | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 4-Methylphenol                      | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 4-Nitrophenol                       | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Pentachlorophenol                   | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Phenol                              | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
|                                     |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| PAHs                                |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| 2-Chloronaphthalene                 | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| 2-Methylnaphthalene                 | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Naphthalene                         | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Acenaphthylene                      | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Acenaphthene                        | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Fluorene                            | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Phenanthrene                        | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Anthracene                          | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Fluoranthene                        | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Pyrene                              | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Benz(a)anthracene                   | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Chrysene                            | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Benzo(b)kfluoranthene               | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Benzo(a)pyrene                      | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Indeno(123cd)pyrene                 | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Dibenzo(ah)anthracene               | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Benzo(ghi)perylene                  | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
|                                     |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Phthalates                          |          |       |                              |                               |                   |                 |                   |                                              |            |                  |                   |                     |                                                        |         |                                         |         |
| Bis(2-ethylhexyl) phthalate         | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Butylbenzyl phthalate               | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Di-n-butyl phthalate                | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Di-n-Octyl phthalate                | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Diethyl phthalate                   | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Dimethyl phthalate                  | µg/ l    | <10   | <10                          | <10                           | -                 | -               | <10               | <10                                          | -          | -                | <10               | <10                 | ~                                                      | ~       | ~                                       | ~       |
| Total Phthalate                     | µg/ l    | <60   | <60                          | <60                           | -                 | -               | <60               | <60                                          | -          | -                | <60               | <60                 | ~                                                      | ~       | ~                                       | ~       |

Notes:  
*Italics* indicates groundwater quality standard lower than method detection limit.  
**Bold** denotes value exceeds groundwater quality standard.  
MDL denotes method detection limit.  
ND denotes not detected. The TICs compounds reported have a minimum of 80 % certainty of being present.  
♦ denotes no method detection limit.  
# denotes standard relates to phenols.  
~ denotes groundwater quality standard unavailable.  
\* denotes standards converted from ammonium (NH4) to ammonia as N (=14/18).  
\*\* denotes standard is for total xylenes.  
- denotes parameter not analysed/ recorded.  
1: Environmental Protection Agency (EPA), 2000. Landfill Manuals, Landfill Site Design. EPA, Ireland.



Table 10: Leachate Analytical Results

| Sample ID                   |       |      | BH6        |            | BH10       |            | BH11       |            | BH13       |            | BH14       |            | EPA Landfill Manual - Leachate Management <sup>1</sup> |         |                                         |         |
|-----------------------------|-------|------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------------------------------------------------|---------|-----------------------------------------|---------|
| Laboratory Report No.       |       |      | 09/1801    | 09/2082    | 09/1801    | 09/2082    | 09/1801    | 09/2082    | 09/1801    | 09/2082    | 09/1801    | 09/2082    | Acetogenic Leachates<br>(Table 7.1 )                   |         | Methanogenic Leachates<br>(Table 7.1 2) |         |
| Sample Date                 |       |      | 25/06/2009 | 16/07/2009 | 25/06/2009 | 16/07/2009 | 25/06/2009 | 16/07/2009 | 25/06/2009 | 16/07/2009 | 25/06/2009 | 15/07/2009 | Minimum                                                | Maximum | Minimum                                 | Maximum |
| Laboratory Parameters       | Unit  | MDL  |            |            |            |            |            |            |            |            |            |            |                                                        |         |                                         |         |
| Additional SVOCs            |       |      |            |            |            |            |            |            |            |            |            |            |                                                        |         |                                         |         |
| SVOC TICs (trace organics)  | µg/l  | <100 | ND         | ND         | -          | -          | ND         | ND         | -          | -          | ND         | ND         | ~                                                      | ~       | ~                                       | ~       |
| 1,2-Dichlorobenzene         | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 1,2,4-Trichlorobenzene      | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 1,3-Dichlorobenzene         | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 1,4-Dichlorobenzene         | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 2-Nitroaniline              | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 2,4-Dinitrotoluene          | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 2,6-Dinitrotoluene          | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 3-Nitroaniline              | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 4-Bromophenylphenylether    | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 4-Chloroaniline             | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 4-Chlorophenylphenylether   | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| 4-Nitroaniline              | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Azobenzene                  | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Bis(2-chloroethoxy)methane  | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Bis(2-chloroethyl)ether     | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Carbazole                   | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Dibenzofuran                | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Hexachlorobenzene           | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Hexachlorobutadiene         | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Hexachlorocyclopentadiene   | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Hexachloroethane            | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Isophorone                  | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| N-nitrosodi-n-propylamine   | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
| Nitrobenzene                | µg/ l | <10  | <10        | <10        | -          | -          | <10        | <10        | -          | -          | <10        | <10        | ~                                                      | ~       | ~                                       | ~       |
|                             |       |      |            |            |            |            |            |            |            |            |            |            | ~                                                      | ~       | ~                                       | ~       |
| VOCs                        |       |      |            |            |            |            |            |            |            |            |            |            | ~                                                      | ~       | ~                                       | ~       |
| VOCs TICs (trace organics)  | µg/l  | <100 | ND         | ND         | -          | -          | ND         | ND         | -          | -          | ND         | ND         | ~                                                      | ~       | ~                                       | ~       |
| Dichlorodifluoromethane     | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Methyl Tertiary Butyl Ether | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Chloromethane               | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Vinyl Chloride              | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Bromomethane                | µg/l  | <1   | <1         | <1         | -          | -          | <1         | <1         | -          | -          | <1         | <1         | ~                                                      | ~       | ~                                       | ~       |
| Chloroethane                | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Trichlorofluoromethane      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,1-Dichloroethene          | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Dichloromethane             | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| trans-1-2-Dichloroethene    | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,1-Dichloroethane          | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| cis-1-2-Dichloroethene      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 2,2-Dichloropropane         | µg/l  | <1   | <1         | <1         | -          | -          | <1         | <1         | -          | -          | <1         | <1         | ~                                                      | ~       | ~                                       | ~       |
| Bromochloromethane          | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Chloroform                  | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,1,1-Trichloroethane       | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,1-Dichloropropene         | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Carbon tetrachloride        | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,2-Dichloroethane          | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Benzene                     | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Trichloroethene             | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,2-Dichloropropane         | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Dibromomethane              | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Bromodichloromethane        | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| cis-1-3-Dichloropropene     | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Toluene                     | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| trans-1-3-Dichloropropene   | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,1,2-Trichloroethane       | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Tetrachloroethene           | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,3-Dichloropropane         | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Dibromochloromethane        | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,2-Dibromoethane           | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Chlorobenzene               | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,1,1,2-Tetrachloroethane   | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Ethylbenzene                | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| p/m-Xylene                  | µg/l  | <5   | <5         | <5         | -          | -          | <5         | <5         | -          | -          | <5         | <5         | ~                                                      | ~       | ~                                       | ~       |
| o-Xylene                    | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Styrene                     | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Bromoform                   | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| Isopropylbenzene            | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,1,2,2-Tetrachloroethane   | µg/l  | <4   | <4         | <4         | -          | -          | <4         | <4         | -          | -          | <4         | <4         | ~                                                      | ~       | ~                                       | ~       |
| Bromobenzene                | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,2,3-Trichloropropane      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Propylbenzene               | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 2-Chlorotoluene             | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,3,5-Trimethylbenzene      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 4-Chlorotoluene             | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| tert-Butylbenzene           | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,2,4-Trimethylbenzene      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| sec-Butylbenzene            | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 4-Isopropyltoluene          | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,3-Dichlorobenzene         | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,4-Dichlorobenzene         | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| n-Butylbenzene              | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,2-Dichlorobenzene         | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| 1,2-Dibromo-3-chloropropane | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,2,4-Trichlorobenzene      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Hexachlorobutadiene         | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |
| Naphthalene                 | µg/l  | <2   | <2         | <2         | -          | -          | <2         | <2         | -          | -          | <2         | <2         | ~                                                      | ~       | ~                                       | ~       |
| 1,2,3-Trichlorobenzene      | µg/l  | <3   | <3         | <3         | -          | -          | <3         | <3         | -          | -          | <3         | <3         | ~                                                      | ~       | ~                                       | ~       |

Notes:  
*Italics* indicates groundwater quality standard lower than method detection limit.  
**Bold** denotes value exceeds groundwater quality standard.  
MDL denotes method detection limit.  
ND denotes not detected. The TICs compounds reported have a minimum of 80 % certainty of being present.  
♦ denotes no method detection limit.  
# denotes standard relates to phenols.  
~ denotes groundwater quality standard unavailable.  
\* denotes standards converted from ammonium (NH4) to ammonia as N (=14/18).  
\*\* denotes standard is for total xylenes.  
- denotes parameter not analysed/ recorded.  
1: Environmental Protection Agency (EPA), 2000. Landfill Manuals, Landfill Site Design. EPA, Ireland.

Table 11: Surface Water Analytical Results

| Sample ID                           |          |      | SW1                        | SW2                    | SW3        | SW4             | Surface Water Quality Standards             |                                     |                          |
|-------------------------------------|----------|------|----------------------------|------------------------|------------|-----------------|---------------------------------------------|-------------------------------------|--------------------------|
| Laboratory Report No.               |          |      | 09/2082                    | 09/2082                | 09/2082    | 09/2082         | Surface Water Regulations 2009 <sup>1</sup> |                                     |                          |
| Sample Date                         |          |      | 15/07/2009                 | 15/07/2009             | 15/07/2009 | 15/07/2009      | Annual Mean                                 | 95%ile                              | MAC                      |
| Field Parameters                    | Unit     | MDL  |                            |                        |            |                 |                                             |                                     |                          |
| pH                                  | pH units | ♦    | 7.11                       | 7.04                   | 9.79       | 8.56            | ~                                           | ~                                   | ~                        |
| Electrical Conductivity (EC)        | µS/cm    | ♦    | 18,620                     | 19,490                 | 979        | 429             | ~                                           | ~                                   | ~                        |
| Temperature                         | °C       | ♦    | 17.2                       | 15.8                   | 22.8       | 22.7            | ~                                           | ~                                   | ≤1.5 rise in mixing zone |
| Dissolved Oxygen (DO)               | %        | ♦    | 20.8                       | 19.2                   | 104.9      | 84.5            | ~                                           | >70-<130 (0psu)<br>>80-<120 (35psu) | ~                        |
| Total Dissolved Solids (TDS)        | ppm      | ♦    | 9,800                      | 10,110                 | 491        | 215             | ~                                           | ~                                   | ~                        |
| Sodium Chloride (NaCl)              | %        | ♦    | 37.6                       | 38.9                   | 1.7        | 0.7             | ~                                           | ~                                   | ~                        |
| Oxidation Reduction Potential (ORP) | mV       | ♦    | -44                        | 122                    | -32        | 21              | ~                                           | ~                                   | ~                        |
| Colour                              |          | ♦    | Clear with black particles | Clear with sand grains | Clear      | Slightly yellow | ~                                           | ~                                   | ~                        |
| Odour                               |          | ♦    | None                       | None                   | None       | None            | ~                                           | ~                                   | ~                        |
| Other observations                  | N/A      | ♦    | No sheen                   | No sheen               | No sheen   | No sheen        | ~                                           | ~                                   | ~                        |
| Laboratory Parameters               |          |      |                            |                        |            |                 |                                             |                                     |                          |
| Sulphate                            | mg/l     | 0.05 | 811.15                     | 822.62                 | 253.8      | 17.04           | ~                                           | ~                                   | ~                        |
| Chloride                            | mg/l     | 0.3  | 6,790.3                    | 6,876.8                | 67.2       | 17.4            | ~                                           | ~                                   | ~                        |
| Fluoride                            | mg/l     | 0.3  | 5.7                        | 0.6                    | 0.3        | <0.3            | 1.5                                         | ~                                   | ~                        |
| Ammonia (NH4+NH3) as N              | mg/l     | 0.1  | 82.1                       | 51.8                   | 0.3        | 0.3             | ~                                           | ~                                   | ~                        |
| Total Oxidised Nitrogen as N        | mg/l     | 0.05 | <0.05                      | <0.05                  | <0.05      | <0.05           | ~                                           | ~                                   | ~                        |
| Molybdate Reactive Phosphuros (MRP) | µg/l     | 5    | 135                        | 412                    | 28         | 59              | ≤60 (0-17psu)<br>≤40 (35psu)                | ~                                   | ~                        |
| Total Dissolved Solids (TDS)        | mg/l     | 35   | 12,692                     | 12,596                 | 277        | 571             | ~                                           | ~                                   | ~                        |
| Total Suspended Solids (TSS)        | mg/l     | 10   | 148                        | 158                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Total Alkalinity as CaCO3           | mg/l     | 1    | 848                        | 812                    | 33.2       | 320             | ~                                           | ~                                   | ~                        |
| Total Organic Carbon (TOC)          | mg/l     | 2    | <2                         | <2                     | 3          | 19              | ~                                           | ~                                   | ~                        |
| Total Cyanide                       | µg/l     | 40   | <40                        | <40                    | <40        | <40             | 10                                          | ~                                   | ~                        |
| Chemical Oxygen Demand (COD)        | mg/l     | 7    | 167                        | 163                    | 16         | 45              | ~                                           | ~                                   | ~                        |
| Biochemical Oxygen Demand (BOD)     | mg/l     | 1    | 14                         | 11                     | 5          | 10              | ~                                           | ≤4                                  | ~                        |
| Metals                              |          |      |                            |                        |            |                 |                                             |                                     |                          |
| Mercury - total                     | µg/l     | 1    | <1                         | <1                     | <1         | <1              | 0.05                                        | ~                                   | 0.07                     |
| Boron - total                       | µg/l     | 12   | 2,107                      | 2,052                  | 260        | 81              | ~                                           | ~                                   | ~                        |
| Arsenic - total                     | µg/l     | 2.5  | <2.5                       | <2.5                   | <2.5       | 3.3             | ~                                           | ~                                   | ~                        |
| Zinc - total                        | µg/l     | 3    | 13                         | 11                     | 13         | 14              | ~                                           | ~                                   | ~                        |
| Lead - total                        | µg/l     | 5    | <5                         | <5                     | <5         | 5               | 7.2                                         | ~                                   | ~                        |
| Nickel - total                      | µg/l     | 2    | <2                         | <2                     | 3          | 5               | 20                                          | ~                                   | ~                        |
| Copper - total                      | µg/l     | 7    | <7                         | <7                     | 8          | <7              | ~                                           | ~                                   | ~                        |
| Chromium - total                    | µg/l     | 1.5  | <1.5                       | <1.5                   | <1.5       | <1.5            | 0.6                                         | ~                                   | ~                        |
| Cadmium - total                     | µg/l     | 0.5  | <0.5                       | <0.5                   | <0.5       | <0.5            | 0.2                                         | ~                                   | ≤0.45                    |
| Manganese - total                   | µg/l     | 2    | 309                        | 343                    | 8          | 82              | ~                                           | ~                                   | ~                        |
| Iron - total                        | µg/l     | 20   | 625                        | 648                    | 60         | 1,066           | ~                                           | ~                                   | ~                        |
| Potassium - total                   | mg/l     | 0.04 | 299.6                      | 306                    | 16.56      | 6.98            | ~                                           | ~                                   | ~                        |
| Sodium - total                      | mg/l     | 0.15 | 2,160                      | 2,188                  | 45.01      | 10.53           | ~                                           | ~                                   | ~                        |
| Calcium - total                     | mg/l     | 0.03 | 215.6                      | 226                    | 67.97      | 60.21           | ~                                           | ~                                   | ~                        |
| Magnesium - total                   | mg/l     | 0.02 | 179                        | 163.3                  | 3.8        | 3.6             | ~                                           | ~                                   | ~                        |
| Pesticides                          |          |      |                            |                        |            |                 |                                             |                                     |                          |
| Atrazine                            | µg/l     | 1    | <1                         | <1                     | <1         | <1              | 0.6                                         | ~                                   | 2                        |
| Simazine                            | µg/l     | 1    | <1                         | <1                     | <1         | <1              | 1                                           | ~                                   | 4                        |
| Phenols                             |          |      |                            |                        |            |                 |                                             |                                     |                          |
| 2-Chlorophenol                      | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2-Methylphenol                      | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2-Nitrophenol                       | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2,4-Dichlorophenol                  | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2,4-Dimethylphenol                  | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2,4,5-Trichlorophenol               | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2,4,6-Trichlorophenol               | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 4-Chloro-3-methylphenol             | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 4-Methylphenol                      | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 4-Nitrophenol                       | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Pentachlorophenol                   | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.4                                         | ~                                   | ~                        |
| Phenol                              | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 8                                           | ~                                   | 46                       |
| PAHs                                |          |      |                            |                        |            |                 |                                             |                                     |                          |
| 2-Chloronaphthalene                 | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| 2-Methylnaphthalene                 | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Naphthalene                         | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 1.2                                         | ~                                   | ~                        |
| Acenaphthylene                      | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Acenaphthene                        | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Fluorene                            | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Phenanthrene                        | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Anthracene                          | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.1                                         | ~                                   | 0.4                      |
| Fluoranthene                        | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.1                                         | ~                                   | 1                        |
| Pyrene                              | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Benz(a)anthracene                   | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Chrysene                            | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Benzo(b)k)fluoranthene              | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.03 *                                      | ~                                   | ~                        |
| Benzo(a)pyrene                      | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.05                                        | ~                                   | 0.1                      |
| Indeno(123cd)pyrene                 | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.002                                       | ~                                   | ~                        |
| Dibenzo(ah)anthracene               | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Benzo(ghi)perylene                  | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 0.002                                       | ~                                   | ~                        |
| Phthalates                          |          |      |                            |                        |            |                 |                                             |                                     |                          |
| Bis(2-ethylhexyl) phthalate         | µg/l     | 10   | <10                        | <10                    | <10        | <10             | 1.3                                         | ~                                   | ~                        |
| Butylbenzyl phthalate               | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Di-n-butyl phthalate                | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Di-n-Octyl phthalate                | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Diethyl phthalate                   | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Dimethyl phthalate                  | µg/l     | 10   | <10                        | <10                    | <10        | <10             | ~                                           | ~                                   | ~                        |
| Total Phthalate                     | µg/l     | 60   | <60                        | <60                    | <60        | <60             | ~                                           | ~                                   | ~                        |

Notes:

*Italics* indicates that one or more of surface water quality standards are lower than method detection limit.

**Bold** denotes result value exceeds one or more of the surface water quality standards.

MDL denotes method detection limit.

ND denotes not detected. The TICs compounds reported have an minimum of 80 % certainty of being present.

MAC denotes maximum allowable concentration.

psu denotes Practical Salinity Units. The PSU defines salinity in terms of a conductivity ratio of a sample to that of a solution of 32.4356 g of KCL at 15°C in 1 kg of solution. A sample of seawater at 15°C with a conductivity equal to this KCL solution has a salinity of exactly 35 practical salinity units.

\* denotes standard relates to the sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene.

♦ denotes no method detection limit.

~ denotes no surface water quality standard available.

1: European Communities Environmental Objectives (Surface Waters) Regulations 2009; S.I. No. 272 of 2009. Transitional Water body standards.



Table 11: Surface Water Analytical Results

| Sample ID                   |      |     | SW1        | SW2        | SW3        | SW4        | Surface Water Quality Standards             |        |        |
|-----------------------------|------|-----|------------|------------|------------|------------|---------------------------------------------|--------|--------|
| Laboratory Report No.       |      |     | 09/2082    | 09/2082    | 09/2082    | 09/2082    | Surface Water Regulations 2009 <sup>1</sup> |        |        |
| Sample Date                 |      |     | 15/07/2009 | 15/07/2009 | 15/07/2009 | 15/07/2009 | Annual Mean                                 | 95%ile | MAC    |
| Laboratory Parameters       | Unit | MDL |            |            |            |            |                                             |        |        |
| Additional SVOCs            |      |     |            |            |            |            |                                             |        |        |
| SVOC TICs (trace organics)  | µg/l | 100 | ND         | ND         | ND         | ND         | ~                                           | ~      | ~      |
| 1,2-Dichlorobenzene         | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 1,2,4-Trichlorobenzene      | µg/l | 10  | <10        | <10        | <10        | <10        | 0.4                                         | ~      | ~      |
| 1,3-Dichlorobenzene         | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 1,4-Dichlorobenzene         | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 2-Nitroaniline              | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 2,4-Dinitrotoluene          | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 2,6-Dinitrotoluene          | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 3-Nitroaniline              | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 4-Bromophenylphenylether    | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 4-Chloroaniline             | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 4-Chlorophenylphenylether   | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| 4-Nitroaniline              | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Azobenzene                  | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Bis(2-chloroethoxy)methane  | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Bis(2-chloroethyl)ether     | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Carbazole                   | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Dibenzofuran                | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Hexachlorobenzene           | µg/l | 10  | <10        | <10        | <10        | <10        | 0.01                                        | ~      | 0.05   |
| Hexachlorobutadiene         | µg/l | 10  | <10        | <10        | <10        | <10        | 0.1                                         | ~      | 0.6    |
| Hexachlorocyclopentadiene   | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Hexachloroethane            | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Isophorone                  | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| N-nitrosodi-n-propylamine   | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| Nitrobenzene                | µg/l | 10  | <10        | <10        | <10        | <10        | ~                                           | ~      | ~      |
| VOCs                        |      |     |            |            |            |            |                                             |        |        |
| VOCs TICs (trace organics)  | µg/l | 100 | ND         | ND         | ND         | ND         | ~                                           | ~      | ~      |
| Dichlorodifluoromethane     | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Methyl Tertiary Butyl Ether | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Chloromethane               | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| Vinyl Chloride              | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Bromomethane                | µg/l | 1   | <1         | <1         | <1         | <1         | ~                                           | ~      | ~      |
| Chloroethane                | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| Trichlorofluoromethane      | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,1-Dichloroethene          | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| Dichloromethane             | µg/l | 3   | <3         | <3         | <3         | <3         | 20                                          | ~      | ~      |
| trans-1-2-Dichloroethene    | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,1-Dichloroethane          | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| cis-1-2-Dichloroethene      | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 2,2-Dichloropropane         | µg/l | 1   | <1         | <1         | <1         | <1         | ~                                           | ~      | ~      |
| Bromochloromethane          | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Chloroform                  | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,1,1-Trichloroethane       | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,1-Dichloropropene         | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| Carbon tetrachloride        | µg/l | 2   | <2         | <2         | <2         | <2         | 12                                          | ~      | ~      |
| 1,2-Dichloroethane          | µg/l | 2   | <2         | <2         | <2         | <2         | 10                                          | ~      | ~      |
| Benzene                     | µg/l | 3   | <3         | <3         | <3         | <3         | 8                                           | ~      | 50     |
| Trichloroethene             | µg/l | 3   | <3         | <3         | <3         | <3         | 10                                          | ~      | ~      |
| 1,2-Dichloropropane         | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Dibromomethane              | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| Bromodichloromethane        | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| cis-1-3-Dichloropropene     | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Toluene                     | µg/l | 3   | <3         | <3         | <3         | <3         | 10                                          | ~      | ~      |
| trans-1-3-Dichloropropene   | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| 1,1,2-Trichloroethane       | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Tetrachloroethene           | µg/l | 3   | <3         | <3         | <3         | <3         | 10                                          | ~      | ~      |
| 1,3-Dichloropropane         | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Dibromochloromethane        | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| 1,2-Dibromoethane           | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Chlorobenzene               | µg/l | 2   | <2         | <2         | <2         | <2         | 25                                          | ~      | ~      |
| 1,1,1,2-Tetrachloroethane   | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Ethylbenzene                | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| p/m-Xylene                  | µg/l | 5   | <5         | <5         | <5         | <5         | 10                                          | ~      | ~      |
| o-Xylene                    | µg/l | 3   | <3         | <3         | <3         | <3         | 10                                          | ~      | ~      |
| Styrene                     | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Bromoform                   | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| Isopropylbenzene            | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,1,2,2-Tetrachloroethane   | µg/l | 4   | <4         | <4         | <4         | <4         | ~                                           | ~      | ~      |
| Bromobenzene                | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| 1,2,3-Trichloropropane      | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| Propylbenzene               | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 2-Chlorotoluene             | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,3,5-Trimethylbenzene      | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 4-Chlorotoluene             | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| tert-Butylbenzene           | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,2,4-Trimethylbenzene      | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| sec-Butylbenzene            | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 4-Isopropyltoluene          | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,3-Dichlorobenzene         | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,4-Dichlorobenzene         | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| n-Butylbenzene              | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,2-Dichlorobenzene         | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | ~      |
| 1,2-Dibromo-3-chloropropane | µg/l | 2   | <2         | <2         | <2         | <2         | ~                                           | ~      | ~      |
| 1,2,4-Trichlorobenzene      | µg/l | 3   | <3         | <3         | <3         | <3         | 0.4                                         | ~      | ~      |
| Hexachlorobutadiene         | µg/l | 3   | <3         | <3         | <3         | <3         | 0.1                                         | ~      | 0.6    |
| Naphthalene                 | µg/l | 2   | <2         | <2         | <2         | <2         | 1.2                                         | ~      | ~      |
| 1,2,3-Trichlorobenzene      | µg/l | 3   | <3         | <3         | <3         | <3         | ~                                           | ~      | 0.4    |
| Organotin Compounds         |      |     |            |            |            |            |                                             |        |        |
| Dibutyltin                  | µg/l | 0.1 | <0.1       | <0.1       | <0.1       | <0.1       | ~                                           | ~      | ~      |
| Tributyltin                 | µg/l | 0.1 | <0.1       | <0.1       | <0.1       | <0.1       | 0.0002                                      | ~      | 0.0015 |
| Triphenyltin                | µg/l | 0.1 | <0.1       | <0.1       | <0.1       | <0.1       | ~                                           | ~      | ~      |

Notes:

*Italics* indicates that one or more of surface water quality standards are lower than method detection limit.

**Bold** denotes result value exceeds one or more of the surface water quality standards.

MDL denotes method detection limit.

ND denotes not detected. The TICs compounds reported have an minimum of 80 % certainty of being present.

MAC denotes maximum allowable concentration.

psu denotes Practical Salinity Units. The PSU defines salinity in terms of a conductivity ratio of a sample to that of a solution of 32.4356 g of KCL at 15°C in l kg of solution. A sample of seawater at 15°C with a conductivity equal to this KCL solution has a salinity of exactly 35 practical salinity units.

\* denotes standard relates to the sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene.

♦ denotes no method detection limit.

~ denotes no surface water quality standard available.

1: European Communities Environmental Objectives (Surface Waters) Regulations 2009; S.I. No. 272 of 2009. Transitional Water body standards.

Table 13: Landfill Gas Monitoring Results

| Monitoring Well I.D. | Monitoring Event | Monitoring Date | Monitoring Time (24 hr) | Units | Stable Methane (CH <sub>4</sub> ) | Peak Methane (CH <sub>4</sub> ) | LEL  | Carbon Dioxide (CO <sub>2</sub> ) | Oxygen (O <sub>2</sub> ) | Nitrogen (N <sub>2</sub> ) | Balance | Hydrogen Sulphide (H <sub>2</sub> S) | Carbon Monoxide (CO) | Flow Measurement | Atmospheric Pressure | Relative Pressure | Residual Nitrogen | Depth to Water | Water Level   | Low Tide Times | High Tide Times |   |   |   |   |   |
|----------------------|------------------|-----------------|-------------------------|-------|-----------------------------------|---------------------------------|------|-----------------------------------|--------------------------|----------------------------|---------|--------------------------------------|----------------------|------------------|----------------------|-------------------|-------------------|----------------|---------------|----------------|-----------------|---|---|---|---|---|
|                      |                  |                 |                         |       | %                                 | %                               |      | %                                 | %                        | %                          | %       | %                                    | %                    |                  | %                    | %                 | %                 |                |               |                |                 | % | % | % | % | % |
|                      |                  |                 |                         |       | ppm                               | ppm                             |      | ppm                               | l/h                      | mb                         | mb      | %                                    | mbTOC                |                  | mAOD                 | 24 hr             |                   |                |               |                |                 |   |   |   |   |   |
| BH1                  | M1               | 29/06/2009      | 12:15                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 19.7                              | -                        | 80.2                       | 0       | 0                                    | 0                    | -                | 1014                 | -0.21             | -                 | 3.950          | 1.621         | 05:40 / 18:07  | 12:08 / 00:28   |   |   |   |   |   |
|                      | M2               | 03/07/2009      | 12:35                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.4                              | 79.5                     | -                          | 0       | 0                                    | 0                    | -                | 1007                 | -                 | -                 | 4.190          | 1.381         | 09:53 / 22:21  | 03:49 / 16:15   |   |   |   |   |   |
|                      | M3               | 07/07/2009      | 11:53                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.8                              | 79.1                     | -                          | 0       | 0                                    | 0                    | -                | 1010                 | -                 | -                 | 4.040          | 1.531         | 00:27 / 12:39  | 06:57 / 19:03   |   |   |   |   |   |
|                      | M4               | 15/07/2009      | 17:30                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.2                              | 79.8                     | -                          | 0       | 0                                    | 0                    | -                | 1011                 | -                 | -                 | NA             | NA            | 04:27 / 16:50  | 11:05 / 23:35   |   |   |   |   |   |
|                      | M5               | 16/07/2009      | 15:00                   | 0.1   | 0.1                               | 1.5                             | 0.1  | 20.8                              | -                        | 79.0                       | 0       | 0                                    | 0.0                  | 1013             | -                    | -                 | 4.020             | 1.551          | 05:20 / 17:57 | 12:00 / 23:30  |                 |   |   |   |   |   |
|                      | M6               | 18/09/2009      | 12:35                   | 0.1   | 0.6                               | 2.0                             | 0.7  | 20.2                              | -                        | 79.0                       | 0       | 0                                    | -0.1                 | 1015             | 0.36                 | -                 | NA                | NA             | 10:57 / 23:24 | 05:06 / 17:24  |                 |   |   |   |   |   |
|                      | M7               | 18/09/2009      | 15:00                   | 0.5   | 1.6                               | 9.0                             | 1.1  | 20.2                              | -                        | 78.2                       | 0       | 0                                    | 0.0                  | 1013             | 0.33                 | -                 | NA                | NA             | 10:57 / 23:24 | 05:06 / 17:24  |                 |   |   |   |   |   |
|                      | M8               | 07/10/2009      | 12:12                   | 0.0   | 0.0                               | 0.0                             | 0.8  | 20.6                              | -                        | 78.60                      | 0       | 0                                    | 0.0                  | 1010             | 0.29                 | 0.73              | NA                | NA             | 01:48 / 14:08 | 08:21 / 20:41  |                 |   |   |   |   |   |
|                      | M9               | 07/10/2009      | 15:06                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.6                              | -                        | 79.30                      | 0       | 0                                    | 0.0                  | 1010             | 0.26                 | 1.43              | NA                | NA             | 01:48 / 14:08 | 08:21 / 20:41  |                 |   |   |   |   |   |
|                      | M10              | 21/01/2010      | 09:07                   | 7.3   | 20.8                              | >>>                             | 4.4  | 18.7                              | -                        | 69.60                      | 0       | 0                                    | -0.1                 | 999              | -                    | 0                 | NA                | NA             | 02:55 / 15:14 | 09:30 / 21:55  |                 |   |   |   |   |   |
|                      | M11              | 22/02/2010      | 13:04                   | 0.0   | 0.0                               | 0.0                             | 0.2  | 20.8                              | -                        | 79.00                      | 0       | 0                                    | 0.0                  | 986              | -                    | 0.38              | NA                | NA             | 04:40 / 17:03 | 11:24 / 23:58  |                 |   |   |   |   |   |
|                      | M12              | 01/03/2010      | 11:30                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.8                              | -                        | 79.10                      | 0       | 0                                    | -0.1                 | 1005             | -                    | 0.48              | NA                | NA             | 12:06         | 06:08 / 18:30  |                 |   |   |   |   |   |
|                      | M13              | 04/03/2010      | 11:03                   | 0.0   | 0.1                               | 0.0                             | 0.1  | 20.5                              | -                        | 79.40                      | 0       | 0                                    | 0.0                  | 1023             | -                    | 1.91              | 3.920             | 1.651          | 01:41 / 14:02 | 08:17 / 20:36  |                 |   |   |   |   |   |
|                      | M14a             | 16/03/2010      | 10:51                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.7                              | -                        | 79.20                      | 0       | 0                                    | 0.0                  | 1013             | -                    | 0.95              | 4.360             | 1.211          | 12:04         | 06:23 / 18:40  |                 |   |   |   |   |   |
|                      | M14b             | 16/03/2010      | 14:39                   | 0.1   | 1.2                               | 1.0                             | 0.1  | 20.8                              | -                        | 78.7                       | 0       | 0                                    | -0.1                 | 1011             | -                    | 0.48              | NA                | NA             | 12:04         | 06:23 / 18:40  |                 |   |   |   |   |   |
|                      | M15**            | 15/04/2010      | 08:36                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | -                          | 78.50   | 0                                    | 0                    | 0.0              | 1022                 | -                 | -                 | 3.685          | 1.886         | 00:54 / 13:03  | 07:25 / 19:36   |   |   |   |   |   |
|                      | M16M             | 23/04/2010      | 09:39                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 21.2                              | -                        | 78.70                      | 0       | 0                                    | 0.0                  | 1008             | -                    | 0                 | 4.310             | 1.260          | 08:17 / 20:46 | 01:43 / 14:30  |                 |   |   |   |   |   |
|                      | M16C             | 23/04/2010      | 09:37                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 21.1                              | -                        | 78.70                      | 0       | 2                                    | -                    | 1014             | 0.84                 | 0                 | NA                | NA             | 08:17 / 20:46 | 01:43 / 14:30  |                 |   |   |   |   |   |
|                      | M18              | 16/06/2010      | 10:47                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.4                              | -                        | 79.50                      | 0       | 0                                    | 0.0                  | 1023             | 0.44                 | 2.39              | 4.510             | 1.061          | 03:02 / 15:13 | 09:38 / 21:51  |                 |   |   |   |   |   |
|                      | M19              | 18/06/2010      | 13:47                   | 0.0   | 0.4                               | 0.0                             | 0.1  | 21.3                              | -                        | 78.60                      | 0       | 0                                    | 0.0                  | 1020             | 0.46                 | 0                 | 4.655             | 0.916          | 04:43 / 17:00 | 11:27 / 23:52  |                 |   |   |   |   |   |
|                      | M20              | 22/06/2010      | 09:55                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 21.0                              | -                        | 78.90                      | 0       | 0                                    | 0.0                  | 1015             | 0.24                 | 0                 | 4.885             | 0.686          | 08:22 / 20:49 | 02:10 / 14:41  |                 |   |   |   |   |   |
|                      | M21              | 25/06/2010      | 16:06                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 21.1                              | -                        | 78.90                      | 0       | 0                                    | 0.1                  | 1011             | 0.7                  | 0                 | 4.825             | 0.746          | 10:45 / 23:08 | 04:53 / 17:06  |                 |   |   |   |   |   |
| BH2                  | M1               | 29/06/2009      | 12:22                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 19.9                              | -                        | 80.0                       | 0       | 7                                    | -                    | 1014             | -0.27                | -                 | 4.580             | 1.758          | 05:40 / 18:07 | 12:08 / 00:28  |                 |   |   |   |   |   |
|                      | M2               | 03/07/2009      | 12:20                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.6                              | 79.3                     | -                          | 0       | 0                                    | 0                    | -                | 1007                 | -                 | -                 | 5.060          | 1.278         | 09:53 / 22:21  | 03:49 / 16:15   |   |   |   |   |   |
|                      | M3               | 07/07/2009      | 12:00                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.8                              | 79.1                     | -                          | 0       | 0                                    | 0                    | -                | 1010                 | -                 | -                 | 4.930          | 1.408         | 00:27 / 12:39  | 06:57 / 19:03   |   |   |   |   |   |
|                      | M4               | 15/07/2009      | 18:00                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.2                              | 79.7                     | -                          | 0       | 0                                    | 0                    | -                | 1011                 | -                 | -                 | NA             | NA            | 04:27 / 16:50  | 11:05 / 23:35   |   |   |   |   |   |
|                      | M5               | 16/07/2009      | 17:30                   | 0.1   | 0.1                               | 2.0                             | 0.3  | 21.6                              | -                        | 78.0                       | 0       | 0                                    | 0.0                  | 1013             | -                    | -                 | 4.910             | 1.428          | 05:20 / 17:57 | 12:00 / 23:30  |                 |   |   |   |   |   |
|                      | M6               | 18/09/2009      | 12:25                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.5                              | -                        | 79.5                       | 0       | 0                                    | -0.1                 | 1015             | 0.32                 | -                 | NA                | NA             | 10:57 / 23:24 | 05:06 / 17:24  |                 |   |   |   |   |   |
|                      | M7               | 18/09/2009      | 14:00                   | 0.0   | 0.3                               | 0.0                             | 0.0  | 20.5                              | -                        | 79.5                       | 0       | 0                                    | 0.0                  | 1014             | 0.35                 | -                 | NA                | NA             | 10:57 / 23:24 | 05:06 / 17:24  |                 |   |   |   |   |   |
|                      | M8               | 07/10/2009      | 13:09                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.8                              | -                        | 79.20                      | 0       | 0                                    | 0.0                  | 1009             | 0.26                 | 0.58              | NA                | NA             | 01:48 / 14:08 | 08:21 / 20:41  |                 |   |   |   |   |   |
|                      | M9               | 07/10/2009      | 15:50                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 21.0                              | -                        | 79.0                       | 0       | 0                                    | 0.0                  | 1010             | 0.34                 | 0                 | NA                | NA             | 01:48 / 14:08 | 08:21 / 20:41  |                 |   |   |   |   |   |
|                      | M10              | 21/01/2010      | 14:50                   | 0.0   | 0.0                               | 0.1                             | 21.2 | 20.7                              | -                        | 78.7                       | 0       | 0                                    | 0.0                  | 997              | -                    | 0                 | NA                | NA             | 02:55 / 15:14 | 09:30 / 21:55  |                 |   |   |   |   |   |
|                      | M11              | 22/02/2010      | 10:36                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 21.4                              | -                        | 78.5                       | 0       | 0                                    | 0.0                  | 985              | -                    | 0                 | NA                | NA             | 04:40 / 17:03 | 11:24 / 23:58  |                 |   |   |   |   |   |
|                      | M12              | 01/03/2010      | 10:57                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.8                              | -                        | 79.1                       | 0       | 0                                    | 0.0                  | 1005             | -                    | 0.48              | NA                | NA             | 12:06         | 06:08 / 18:30  |                 |   |   |   |   |   |
|                      | M13              | 04/03/2010      | 12:48                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.8                              | -                        | 79.1                       | 0       | 0                                    | 0.0                  | 1023             | -                    | 0.48              | 4.880             | 1.458          | 01:41 / 14:02 | 08:17 / 20:36  |                 |   |   |   |   |   |
|                      | M14              | 16/03/2010      | 12:01                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 20.9                              | -                        | 79.0                       | 0       | 0                                    | 0.0                  | 1013             | -                    | 0                 | 5.120             | 1.218          | 12:04         | 06:23 / 18:40  |                 |   |   |   |   |   |
|                      | M15**            | 15/04/2010      | 10:28                   | 0.0   | 0.0                               | 0.0                             | 0.1  | 21.0                              | -                        | 78.9                       | 0       | 0                                    | 0.0                  | 1024             | -                    | 0                 | 4.760             | 1.578          | 00:54 / 13:03 | 07:25 / 19:36  |                 |   |   |   |   |   |
|                      | M16M             | 23/04/2010      | 10:30                   | 0.1   | 1.3                               | 1.0                             | 0.1  | 21.1                              | -                        | 78.7                       | 5.400   | 1                                    | 0.0                  | 1008             | -                    | 0                 | 5.040             | 1.300          | 08:17 / 20:46 | 01:43 / 14:30  |                 |   |   |   |   |   |
|                      | M16C             | 23/04/2010      | 10:33                   | 0.1   | 0.2                               | 0.0                             | 0.1  | 21.1                              | -                        | 78.7                       | 1       | 0                                    | -                    | 1014             | -3.59                | 0                 | NA                | NA             | 08:17 / 20:46 | 01:43 / 14:30  |                 |   |   |   |   |   |
|                      | M18              | 16/06/2010      | 11:13                   | 0.0   | 0.1                               | 0.0                             | 0.1  | 20.5                              | -                        | 79.40                      | 0       | 0                                    | 0.0                  | 1023             | 0.65                 | 1.91              | 5.310             | 1.028          | 03:02 / 15:13 | 09:38 / 21:51  |                 |   |   |   |   |   |
|                      | M19              | 18/06/2010      | 14:18                   | 0.3   | 0.7                               | 0.5                             | 0.3  | 21.2                              | -                        | 78.40                      | 0       | 0                                    | -0.2                 | 1020             | 0.52                 | 0                 | 5.395             | 0.943          | 04:43 / 17:00 | 11:27 / 23:52  |                 |   |   |   |   |   |
|                      | M20              | 22/06/2010      | 10:59                   | 0.2   | 0.4                               | 3.0                             | 0.2  | 20.7                              | -                        | 78.90                      | 0       | 0                                    | -0.1                 | 1015             | 0.7                  | 0.75              | 5.560             | 0.778          | 08:22 / 20:49 | 02:10 / 14:41  |                 |   |   |   |   |   |
|                      | M21              | 25/06/2010      | 16:00                   | 0.1   | 0.1                               | 1.0                             | 1.0  | 21.0                              | -                        | 78.80                      | 0       | 0                                    | 0.1                  | 1011             | 0.65                 | 0                 | 4.580             | 0.858          | 10:45 / 23:08 | 04:53 / 17:06  |                 |   |   |   |   |   |
|                      | M1               | 29/06/2009      | 12:27                   | 0.0   | 0.0                               | 0.0                             | 0.0  | 20.0                              | -                        | 79.9                       | 1       | 0                                    | -                    | 1014             | -0.27                | -                 | 4.390             | 1.948          | 05:40 / 18:07 | 12:08 / 00:28  |                 |   |   |   |   |   |
| M2                   | 03/07/2009       | 12:42           | 0.0                     | 0.0   | 0.0                               | 0.1                             | 20.2 | 79.7                              | -                        | 80.0                       | 0       | 0                                    | 0                    | -                | 1007                 | -                 | -                 | 4.420          | 1.503         | 09:53 / 22:21  | 03:49 / 16:15   |   |   |   |   |   |
| M3                   | 07/07/2009       | 11:45           | 0.0                     | 0.0   | 0.0                               | 0.0                             | 20.8 | 79.1                              | -                        | 79.9                       | 0       | 0                                    | 0                    | -                | 1010                 | -                 | -                 | 4.390          | 1.533         | 00:27 / 12:39  | 06:57 / 19:03   |   |   |   |   |   |
|                      |                  |                 |                         |       |                                   |                                 |      |                                   |                          |                            |         |                                      |                      |                  |                      |                   |                   |                |               |                |                 |   |   |   |   |   |

Table 13: Landfill Gas Monitoring Results

| Monitoring Well I.D. | Monitoring Event | Monitoring Date | Monitoring Time (24 hr) | Stable Methane (CH <sub>4</sub> ) |   |   | Peak Methane (CH <sub>4</sub> ) |   |   | LEL | Carbon Dioxide (CO <sub>2</sub> ) |   |   | Oxygen (O <sub>2</sub> ) |   |   | Nitrogen (N <sub>2</sub> ) |   |   | Balance | Hydrogen Sulphide (H <sub>2</sub> S) |   |   | Carbon Monoxide (CO) |   |   | Flow Measurement | Atmospheric Pressure |   |   | Relative Pressure |   |   | Residual Nitrogen |   |   | Depth to Water | Water Level | Low Tide Times |   | High Tide Times |   |   |   |       |      |       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
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|                      |                  |                 |                         | Units                             |   |   | %                               |   |   |     | %                                 |   |   | %                        |   |   | %                          |   |   |         | %                                    |   |   | ppm                  |   |   |                  | ppm                  |   |   | l/h               |   |   | mb                |   |   |                |             | mb             |   |                 | % |   |   | mbTOC | mAOD | 24 hr |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                      |                  |                 |                         | %                                 | % | % | %                               | % | % |     | %                                 | % | % | %                        | % | % | %                          | % | % |         | %                                    | % | % | %                    | % | % |                  | %                    | % | % | %                 | % | % | %                 | % | % |                |             | %              | % | %               | % | % | % |       |      | %     | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % |

Table 14: Extended Gas Pumping Results

| Borehole ID      | Monitoring Date/Time | Stable Methane (CH <sub>4</sub> ) | Peak Methane (CH <sub>4</sub> ) | LEL  | Carbon Dioxide (CO <sub>2</sub> ) | Oxygen (O <sub>2</sub> ) | Balance | Hydrogen Sulphide (H <sub>2</sub> S) | Carbon Monoxide (CO) | Internal Flow Measurement | Atmospheric Pressure | Relative Pressure | CH <sub>4</sub> /CO <sub>2</sub> | Residual Nitrogen |
|------------------|----------------------|-----------------------------------|---------------------------------|------|-----------------------------------|--------------------------|---------|--------------------------------------|----------------------|---------------------------|----------------------|-------------------|----------------------------------|-------------------|
|                  | Unit                 | (%)                               | (%)                             | %    | (%)                               | (%)                      | %       | ppm                                  | ppm                  | l/h                       | mb                   | mb                | %                                | %                 |
| BH1              | 15/04/2010 08:22     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.4    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:23     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:24     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:25     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:26     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:27     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:27     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:29     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:30     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:31     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:32     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:33     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:34     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:35     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 08:36     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1022.0               | -0.1              | -                                | -                 |
| BH2              | 15/04/2010 10:14     | 0.0                               | 0.4                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.6               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:15     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.6               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:16     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.6               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:17     | 0.0                               | 0.0                             | 0.0  | 0.3                               | 20.9                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.6               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:18     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 20.9                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:19     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:20     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:21     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:22     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:23     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:24     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:25     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:26     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:27     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 10:28     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 0.3               | 0.0                              | 0.0               |
| BH3              | 15/04/2010 11:05     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.6               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:06     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.6               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:07     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:08     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:09     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:10     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.1                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:11     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:12     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.0                     | 78.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:13     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.7               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:14     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.8               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:15     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.9                     | 79.0    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.8               | 0.0                              | 0.0               |
|                  | 15/04/2010 11:16     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.8                     | 79.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.8               | 0.0                              | 0.5               |
|                  | 15/04/2010 11:17     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.8                     | 79.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.8               | 0.0                              | 0.5               |
|                  | 15/04/2010 11:18     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 20.8                     | 79.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.3               | 0.0                              | 0.5               |
|                  | BH4                  | 15/04/2010 13:12                  | 2.2                             | 2.7  | 44.0                              | 1.2                      | 19.4    | 77.2                                 | 0.0                  | 0.0                       | 0.0                  | 1023.0            | 0.9                              | 1.8               |
| 15/04/2010 13:13 |                      | 1.5                               | 2.2                             | 30.0 | 0.9                               | 19.9                     | 77.7    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.9               | 1.7                              | 2.5               |
| 15/04/2010 13:14 |                      | 1.3                               | 1.5                             | 26.0 | 0.8                               | 20.2                     | 77.7    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.9               | 1.6                              | 1.3               |
| 15/04/2010 13:15 |                      | 1.1                               | 1.3                             | 22.0 | 0.7                               | 20.3                     | 77.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.9               | 1.6                              | 1.2               |
| 15/04/2010 13:16 |                      | 0.9                               | 1.1                             | 18.0 | 0.6                               | 20.4                     | 78.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.9               | 1.5                              | 1.0               |
| 15/04/2010 13:17 |                      | 1.0                               | 1.0                             | 20.0 | 0.6                               | 20.3                     | 78.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 0.9               | 1.7                              | 1.4               |
| 15/04/2010 13:18 |                      | 1.0                               | 1.0                             | 20.0 | 0.6                               | 20.3                     | 78.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 1.7                              | 1.4               |
| 15/04/2010 13:19 |                      | 0.9                               | 1.0                             | 18.0 | 0.6                               | 20.4                     | 78.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 1.5                              | 1.0               |
| 15/04/2010 13:20 |                      | 0.8                               | 0.9                             | 16.0 | 0.6                               | 20.4                     | 78.2    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 1.3                              | 1.1               |
| 15/04/2010 13:20 |                      | 0.8                               | 0.8                             | 16.0 | 0.6                               | 20.4                     | 78.2    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 0.5               | 1.3                              | 1.1               |
| 15/04/2010 13:26 |                      | 0.8                               | 1.2                             | 16.0 | 0.5                               | 20.3                     | 78.4    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 1.6                              | 1.7               |
| 15/04/2010 13:27 |                      | 0.6                               | 0.8                             | 12.0 | 0.4                               | 20.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 1.5                              | 1.0               |
| 15/04/2010 13:28 |                      | 0.5                               | 0.7                             | 10.0 | 0.4                               | 20.6                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 1.3                              | 0.6               |
| 15/04/2010 13:29 |                      | 0.6                               | 0.6                             | 12.0 | 0.4                               | 20.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | -10.4             | 1.5                              | 1.0               |
| BH5              |                      | 15/04/2010 09:19                  | 57.8                            | 57.9 | >>>                               | 28.4                     | 0.1     | 13.5                                 | 3.0                  | 3.0                       | 0.0                  | 1023.0            | -0.1                             | -                 |
|                  | 15/04/2010 09:20     | 57.9                              | 58.0                            | >>>  | 28.5                              | 0.0                      | 13.6    | 3.0                                  | 3.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:21     | 58.1                              | 58.1                            | >>>  | 28.5                              | 0.0                      | 13.4    | 4.0                                  | 4.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:22     | 58.0                              | 58.1                            | >>>  | 28.5                              | 0.0                      | 13.4    | 4.0                                  | 4.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:23     | 58.4                              | 58.7                            | >>>  | 28.7                              | 0.0                      | 12.9    | 4.0                                  | 4.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:24     | 58.5                              | 58.7                            | >>>  | 28.6                              | 0.0                      | 12.9    | 4.0                                  | 5.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:25     | 58.7                              | 58.7                            | >>>  | 28.6                              | 0.0                      | 12.8    | 4.0                                  | 4.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:26     | 58.6                              | 58.7                            | >>>  | 28.6                              | 0.0                      | 12.7    | 4.0                                  | 5.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:27     | 58.8                              | 58.8                            | >>>  | 28.7                              | 0.0                      | 12.5    | 4.0                                  | 5.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:28     | 58.8                              | 58.8                            | >>>  | 28.7                              | 0.0                      | 12.6    | 5.0                                  | 5.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:29     | 58.7                              | 58.8                            | >>>  | 28.7                              | 0.0                      | 12.6    | 5.0                                  | 5.0                  | 0.0                       | 1023.0               | -0.1              | -                                | -                 |
|                  | 15/04/2010 09:30     | 58.7                              | 58.8                            | >>>  | 28.7                              | 0.0                      | 12.6    | 5.0                                  | 4.0                  | 0.0                       | 102                  |                   |                                  |                   |

Table 14: Extended Gas Pumping Results

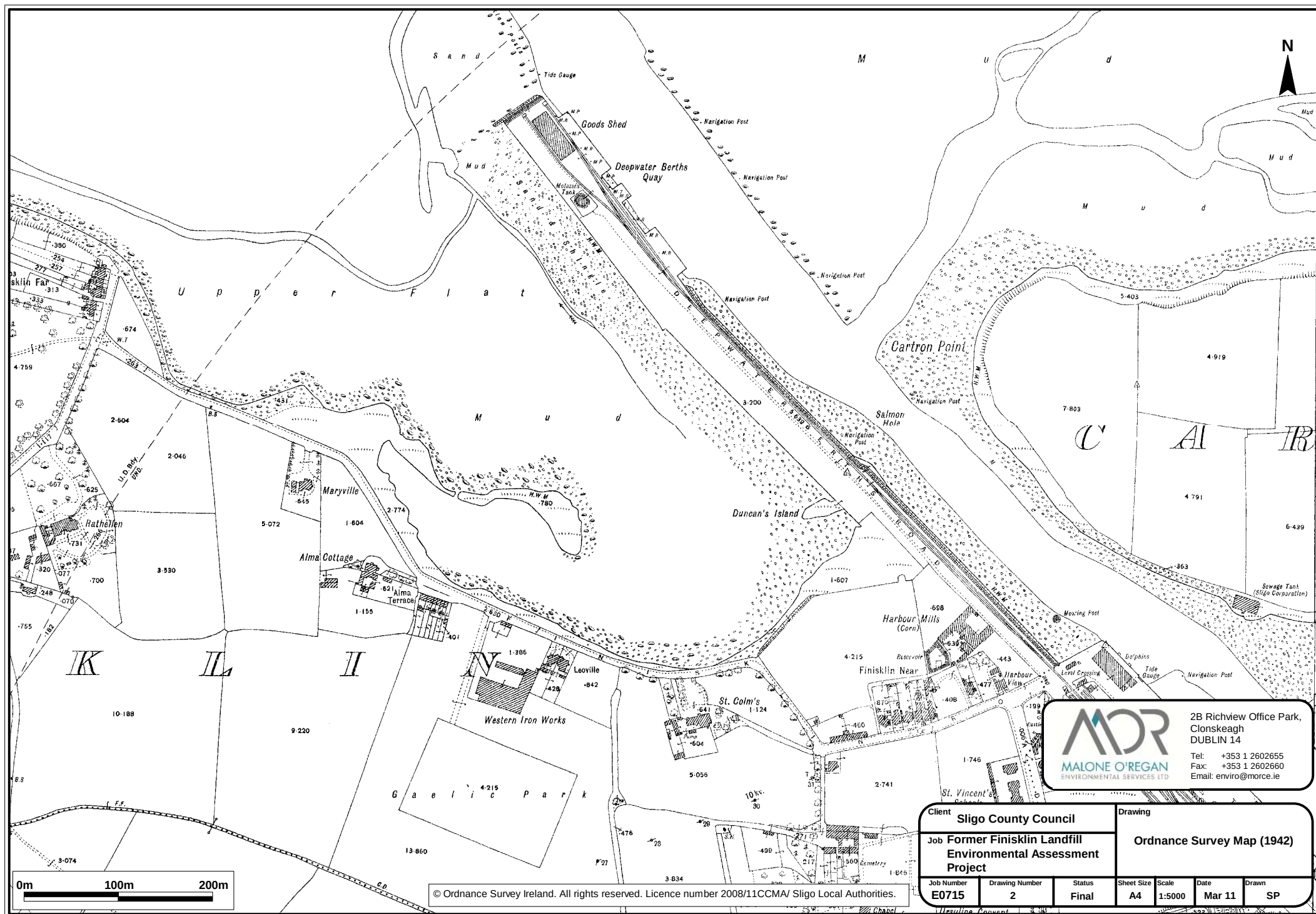
| Borehole ID      | Monitoring Date/Time | Stable Methane (CH <sub>4</sub> ) | Peak Methane (CH <sub>4</sub> ) | LEL  | Carbon Dioxide (CO <sub>2</sub> ) | Oxygen (O <sub>2</sub> ) | Balance | Hydrogen Sulphide (H <sub>2</sub> S) | Carbon Monoxide (CO) | Internal Flow Measurement | Atmospheric Pressure | Relative Pressure | CH <sub>4</sub> /CO <sub>2</sub> | Residual Nitrogen |
|------------------|----------------------|-----------------------------------|---------------------------------|------|-----------------------------------|--------------------------|---------|--------------------------------------|----------------------|---------------------------|----------------------|-------------------|----------------------------------|-------------------|
|                  |                      | Unit                              | (%)                             | (%)  | %                                 | (%)                      | (%)     | %                                    | ppm                  | ppm                       | l/h                  | mb                | mb                               | %                 |
| BH11             | 15/04/2010 17:29     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | 0.0                              | 0.0               |
|                  | 15/04/2010 17:30     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -6.6              | 0.0                              | 0.0               |
|                  | 15/04/2010 17:31     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -7.4              | 0.0                              | 0.0               |
|                  | 15/04/2010 17:32     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -13.6             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:33     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -20.6             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:34     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -27.5             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:35     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.0                     | 78.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -33.3             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:36     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.1                     | 78.7    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -39.5             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:37     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.1                     | 78.7    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -45.2             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:38     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.1                     | 78.7    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -50.9             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:39     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.1                     | 78.7    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -56.2             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:40     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.2                     | 78.6    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -61.6             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:41     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.2                     | 78.6    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -67.1             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:42     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.2                     | 78.6    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -71.6             | 0.0                              | 0.0               |
|                  | 15/04/2010 17:43     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.2                     | 78.6    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | -76.3             | 0.0                              | 0.0               |
| BH13             | 15/04/2010 17:53     | 0.0                               | 0.0                             | 0.0  | 3.2                               | 15.9                     | 80.9    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.1               | 0.0                              | 20.8              |
|                  | 15/04/2010 17:54     | 0.0                               | 0.0                             | 0.0  | 4.5                               | 13.7                     | 81.8    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 30.0              |
|                  | 15/04/2010 17:55     | 0.0                               | 0.0                             | 0.0  | 4.8                               | 13.1                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 32.6              |
|                  | 15/04/2010 17:56     | 0.0                               | 0.0                             | 0.0  | 4.8                               | 13.0                     | 82.2    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.1              |
|                  | 15/04/2010 17:57     | 0.0                               | 0.0                             | 0.0  | 4.8                               | 13.0                     | 82.2    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.1              |
|                  | 15/04/2010 17:58     | 0.0                               | 0.0                             | 0.0  | 4.8                               | 13.0                     | 82.2    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.1              |
|                  | 15/04/2010 17:59     | 0.0                               | 0.0                             | 0.0  | 4.8                               | 13.0                     | 82.2    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.1              |
|                  | 15/04/2010 18:00     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
|                  | 15/04/2010 18:01     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
|                  | 15/04/2010 18:02     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
|                  | 15/04/2010 18:03     | 0.0                               | 0.0                             | 0.0  | 4.8                               | 13.0                     | 82.2    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.1              |
|                  | 15/04/2010 18:04     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
|                  | 15/04/2010 18:05     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
|                  | 15/04/2010 18:06     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
|                  | 15/04/2010 18:07     | 0.0                               | 0.0                             | 0.0  | 4.9                               | 13.0                     | 82.1    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.0               | 0.0                              | 33.0              |
| BH14             | 15/04/2010 12:16     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.4                     | 78.5    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.8               | 0.0                              | 0.0               |
|                  | 15/04/2010 12:17     | 0.0                               | 0.0                             | 0.0  | 0.1                               | 21.3                     | 78.6    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.8               | 0.0                              | 0.0               |
|                  | 15/04/2010 12:18     | 0.0                               | 0.0                             | 0.0  | 0.2                               | 21.2                     | 78.6    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.8               | 0.0                              | 0.0               |
|                  | 15/04/2010 12:19     | 0.1                               | 0.1                             | 2.0  | 0.2                               | 21.1                     | 78.6    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.8               | 0.5                              | 0.0               |
|                  | 15/04/2010 12:20     | 0.1                               | 0.1                             | 2.0  | 0.3                               | 20.9                     | 78.7    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.8               | 0.3                              | 0.0               |
|                  | 15/04/2010 12:21     | 0.2                               | 0.2                             | 4.0  | 0.5                               | 20.5                     | 78.8    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.8               | 0.4                              | 1.3               |
|                  | 15/04/2010 12:22     | 0.5                               | 0.5                             | 10.0 | 0.8                               | 19.6                     | 79.1    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 0.6                              | 5.0               |
|                  | 15/04/2010 12:23     | 1.0                               | 1.0                             | 20.0 | 1.3                               | 18.5                     | 79.2    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 0.8                              | 9.3               |
|                  | 15/04/2010 12:24     | 1.5                               | 1.5                             | 30.0 | 1.6                               | 17.6                     | 79.3    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 0.9                              | 12.8              |
|                  | 15/04/2010 12:25     | 2.0                               | 2.0                             | 40.0 | 1.8                               | 16.7                     | 79.5    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 1.1                              | 16.4              |
|                  | 15/04/2010 12:26     | 2.6                               | 2.6                             | 52.0 | 2.1                               | 16.0                     | 79.3    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 1.2                              | 18.8              |
|                  | 15/04/2010 12:27     | 3.1                               | 3.1                             | 62.0 | 2.2                               | 15.3                     | 79.4    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 1.4                              | 21.6              |
|                  | 15/04/2010 12:28     | 3.8                               | 3.8                             | 76.0 | 2.4                               | 14.7                     | 79.1    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 1.6                              | 23.5              |
|                  | 15/04/2010 12:29     | 4.3                               | 4.3                             | 86.0 | 2.6                               | 14.2                     | 78.9    | 0.0                                  | 0.0                  | -0.1                      | 1023.0               | 0.9               | 1.7                              | 25.2              |
|                  | BH20                 | 15/04/2010 15:00                  | 0.0                             | 0.0  | 0.0                               | 0.0                      | 21.5    | 78.5                                 | 0.0                  | 0.0                       | 0.0                  | 1023.0            | 1.2                              | >>>>              |
| 15/04/2010 15:01 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:02 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:03 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:04 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:05 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:06 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:07 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:08 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:09 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:10 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:11 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:12 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:13 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.5                     | 78.5    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| 15/04/2010 15:14 |                      | 0.0                               | 0.0                             | 0.0  | 0.0                               | 21.4                     | 78.6    | 0.0                                  | 0.0                  | 0.0                       | 1023.0               | 1.2               | >>>>                             | 0.0               |
| BH21             | 15/04/2010 15:34     | 57.8                              | 58.0                            | >>>  | 1.5                               | 1.1                      | 39.6    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 38.5                             | 35.4              |
|                  | 15/04/2010 15:35     | 57.0                              | 57.8                            | >>>  | 1.5                               | 1.1                      | 40.4    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 38.0                             | 36.2              |
|                  | 15/04/2010 15:36     | 56.5                              | 57.0                            | >>>  | 1.5                               | 1.1                      | 40.9    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 37.7                             | 36.7              |
|                  | 15/04/2010 15:37     | 56.6                              | 56.6                            | >>>  | 1.5                               | 1.0                      | 40.9    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 37.7                             | 37.1              |
|                  | 15/04/2010 15:38     | 56.7                              | 56.7                            | >>>  | 1.5                               | 0.9                      | 40.9    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 37.8                             | 37.5              |
|                  | 15/04/2010 15:39     | 57.2                              | 57.2                            | >>>  | 1.5                               | 0.8                      | 40.5    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 38.1                             | 37.5              |
|                  | 15/04/2010 15:40     | 57.3                              | 57.3                            | >>>  | 1.5                               | 0.8                      | 40.4    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 38.2                             | 37.4              |
|                  | 15/04/2010 15:41     | 57.2                              | 57.3                            | >>>  | 1.5                               | 0.8                      | 40.5    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.1               | 38.1                             | 37.5              |
|                  | 15/04/2010 15:42     | 56.3                              | 57.2                            | >>>  | 1.5                               | 1.0                      | 41.2    | 0.0                                  | 1.0                  | 0.0                       | 1024.0               | 1.2               | 37.5                             | 37.4              |
|                  | 15/04/2010 15:43     | 56.1                              | 56.3                            | >>>  | 1.5                               | 1.0                      | 41.4    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.2               | 37.4                             | 37.6              |
|                  | 15/04/2010 15:44     | 56.2                              | 56.3                            | >>>  | 1.5                               | 1.1                      | 41.2    | 0.0                                  | 0.0                  | 0.0                       | 1024.0               | 1.2               | 37.5                             | 37.0              |
|                  | 15/04/2010 15:45     |                                   |                                 |      |                                   |                          |         |                                      |                      |                           |                      |                   |                                  |                   |

# Drawings

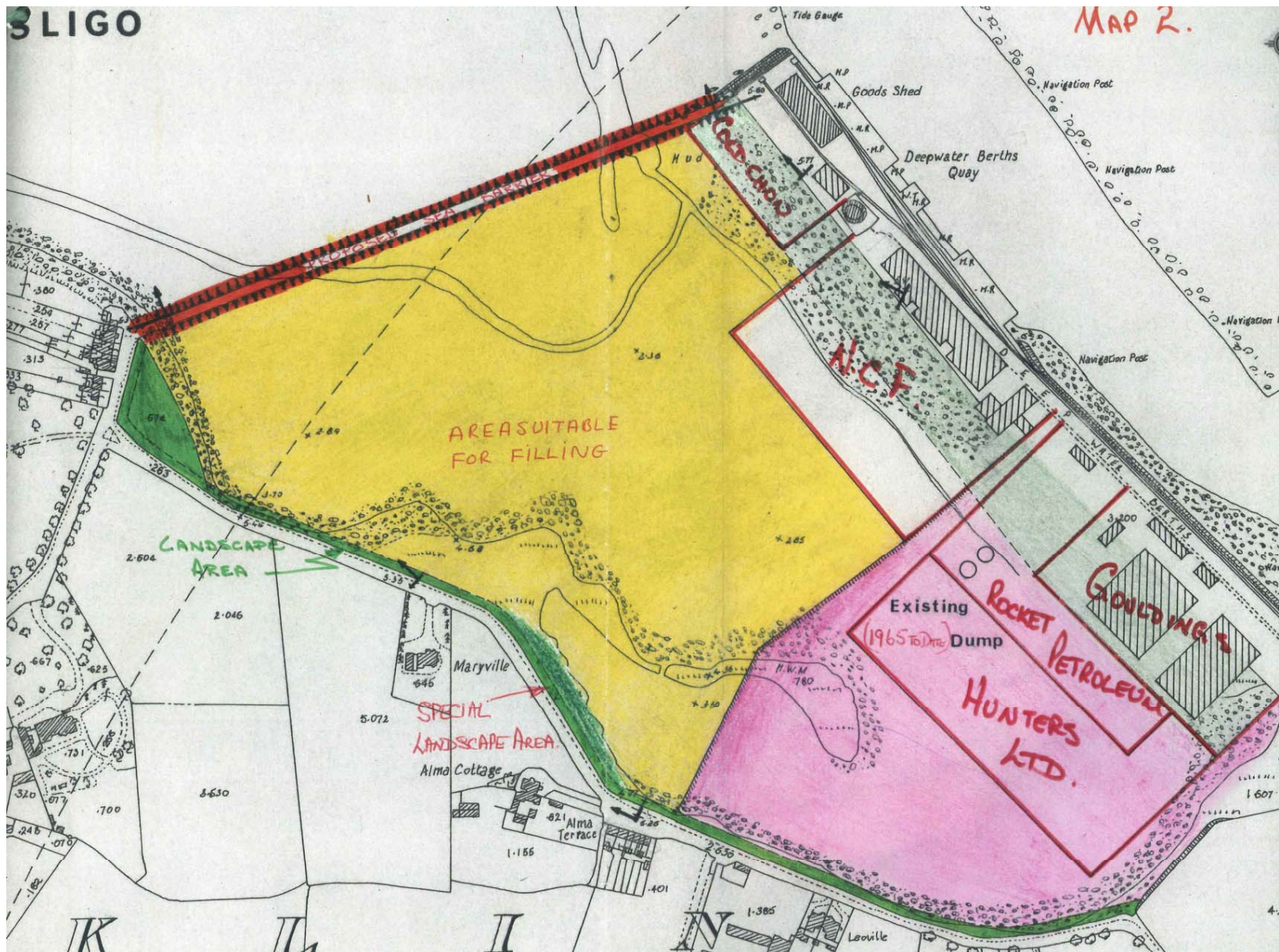












Taken from J. Stewart (County Engineer), 1978, Proposed Central Landfill Site for Sligo Borough and Sligo County Council, November 1978.



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|                                                                      |                     |                 |                                                          |                   |                |             |
|----------------------------------------------------------------------|---------------------|-----------------|----------------------------------------------------------|-------------------|----------------|-------------|
| Client<br>Sligo County Council                                       |                     |                 | Drawing<br>Proposed Central Landfill Site – Map 2 (1978) |                   |                |             |
| Job<br>Former Finisklin Landfill<br>Environmental Assessment Project |                     |                 |                                                          |                   |                |             |
| Job Number<br>E0715                                                  | Drawing Number<br>3 | Status<br>Final | Sht. Size<br>A4                                          | Scale<br>As shown | Date<br>Mar 11 | Drawn<br>SP |





OS XIV.7 EXTRACT

SLIGO  
HARBOUR

# CODISPOSAL SITE EXTENSION

APPROXIMATE LAYOUT ONLY  
1/2500

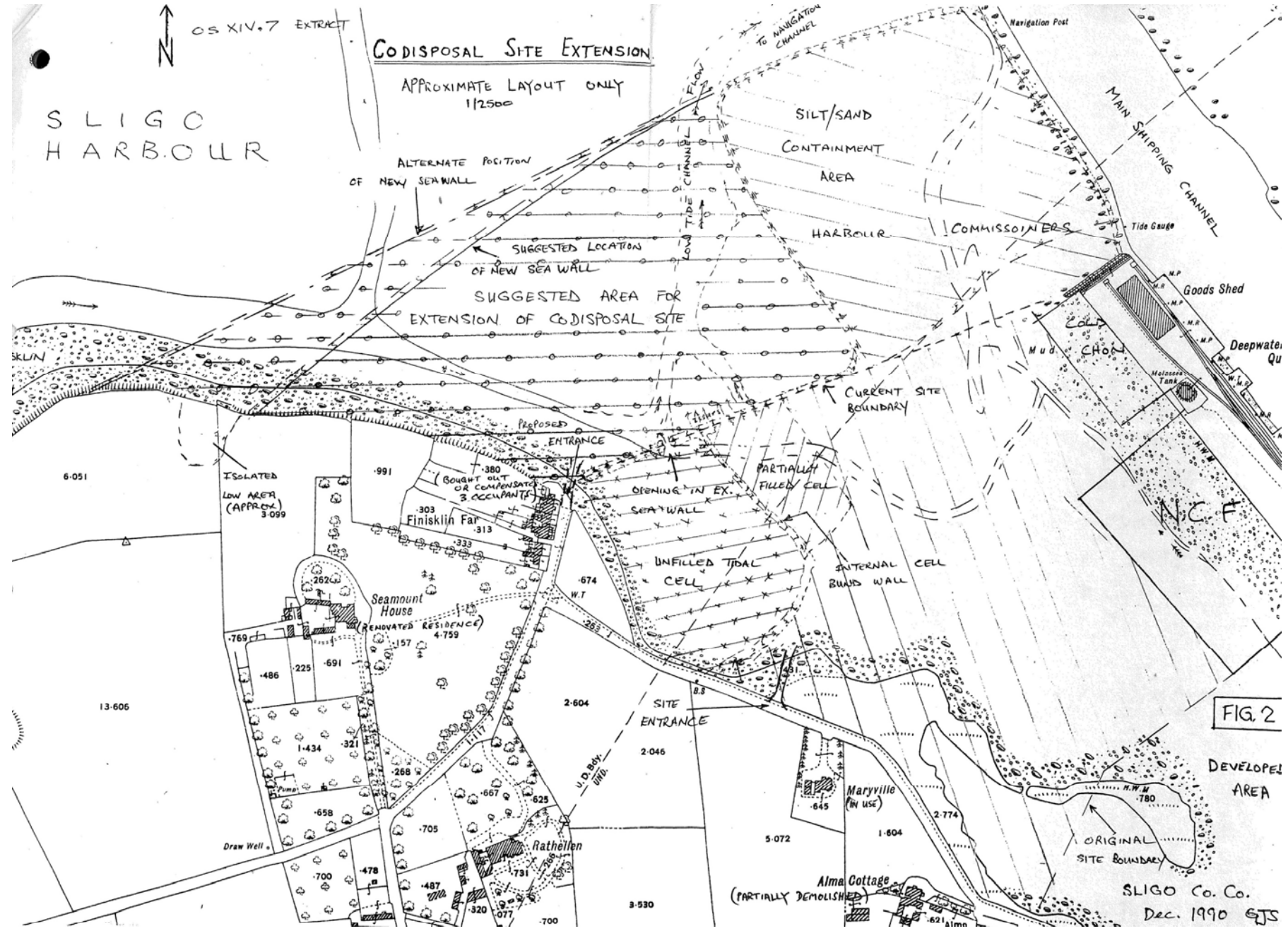


FIG. 2

Taken from G.J. Salter, (1991), Initial Study Relating to the Extension of Finisklin Co-disposal Site, February 1991.



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|                                                                      |                     |                                                                                                        |                 |                   |                |
|----------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------------------------|-----------------|-------------------|----------------|
| Client<br>Sligo County Council                                       |                     | Drawing<br>Initial Study Relating to the<br>Extension of Finisklin Co-<br>Disposal Site - Fig 2 (1990) |                 |                   |                |
| Job<br>Former Finisklin Landfill<br>Environmental Assessment Project |                     |                                                                                                        |                 |                   |                |
| Job Number<br>E0715                                                  | Drawing Number<br>4 | Status<br>Final                                                                                        | Sht. Size<br>A3 | Scale<br>As shown | Date<br>Mar 11 |
|                                                                      |                     |                                                                                                        |                 |                   | Drawn<br>SP    |





Site Location



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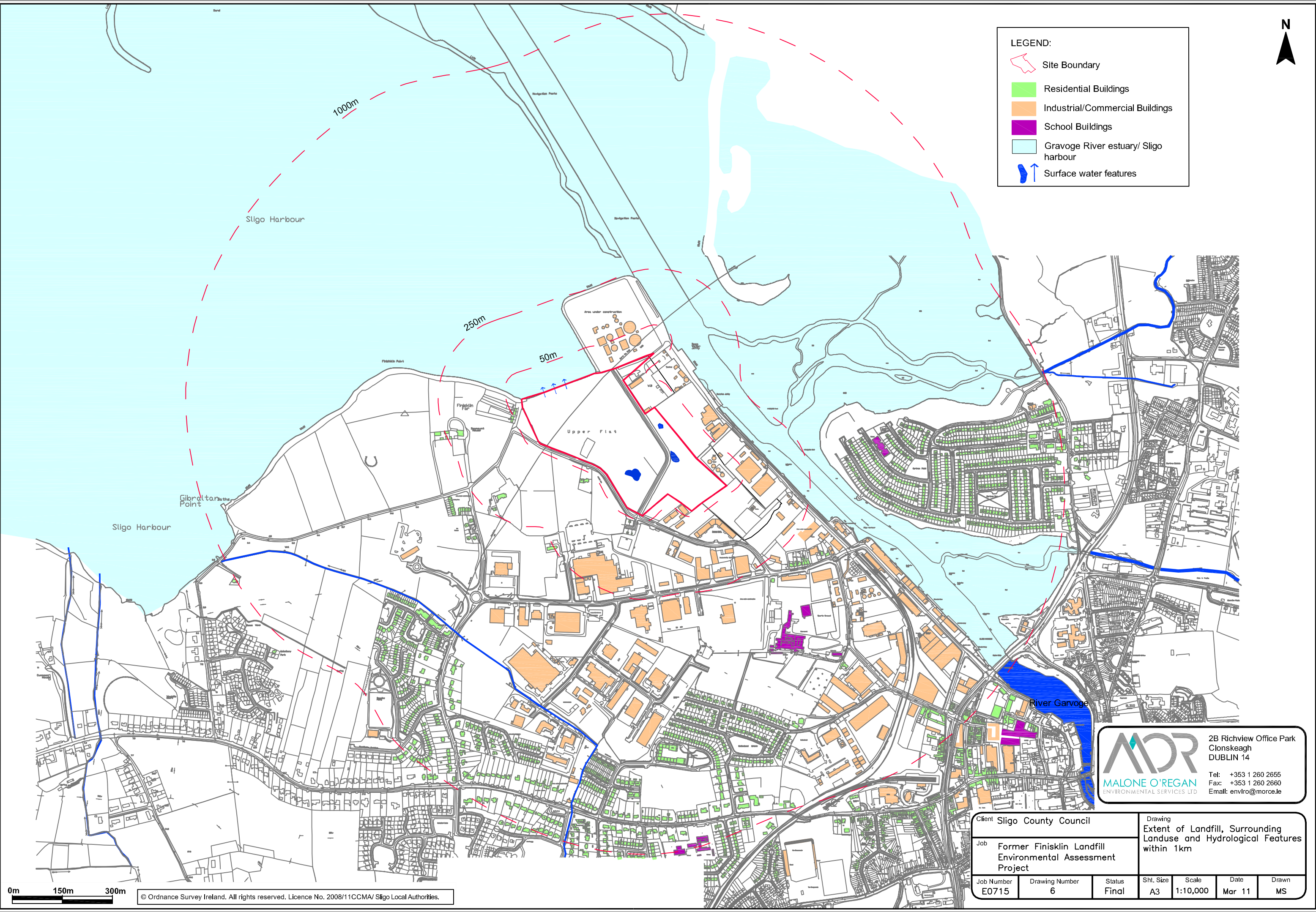
|                                                                                  |                            |                        |                                            |                        |                       |
|----------------------------------------------------------------------------------|----------------------------|------------------------|--------------------------------------------|------------------------|-----------------------|
| Client<br><b>Sligo County Council</b>                                            |                            |                        | Drawing<br><b>Aerial Photograph - 2007</b> |                        |                       |
| Job<br><b>Former Finisklin Landfill<br/>Environmental Assessment<br/>Project</b> |                            |                        |                                            |                        |                       |
| Job Number<br><b>E0715</b>                                                       | Drawing Number<br><b>5</b> | Status<br><b>Final</b> | Sheet Size<br><b>A4</b>                    | Scale<br><b>1:5000</b> | Date<br><b>Mar 11</b> |
|                                                                                  |                            |                        | Drawn<br><b>SP</b>                         |                        |                       |





LEGEND:

- Site Boundary
- Residential Buildings
- Industrial/Commercial Buildings
- School Buildings
- Gravoge River estuary/ Sligo harbour
- Surface water features





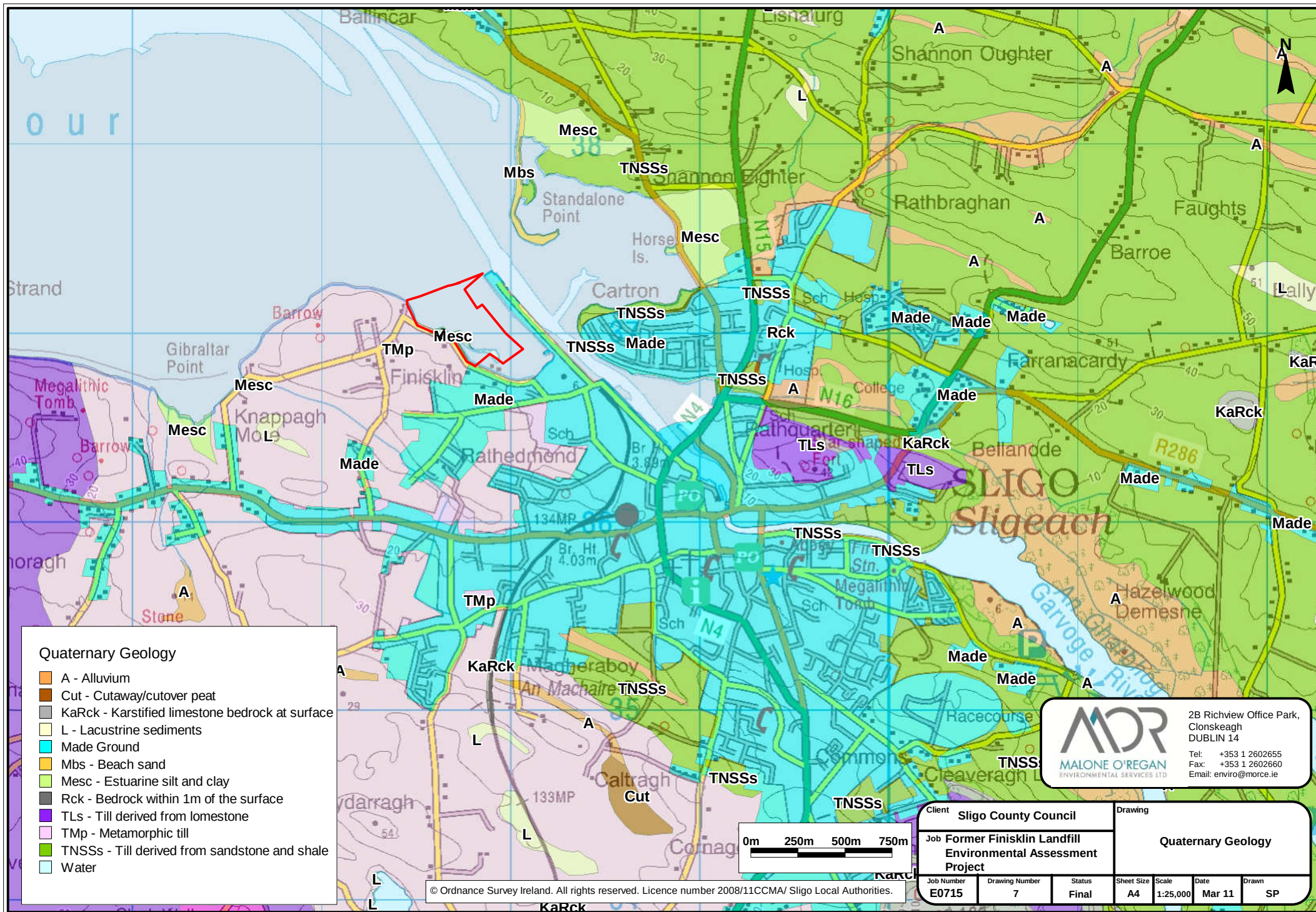
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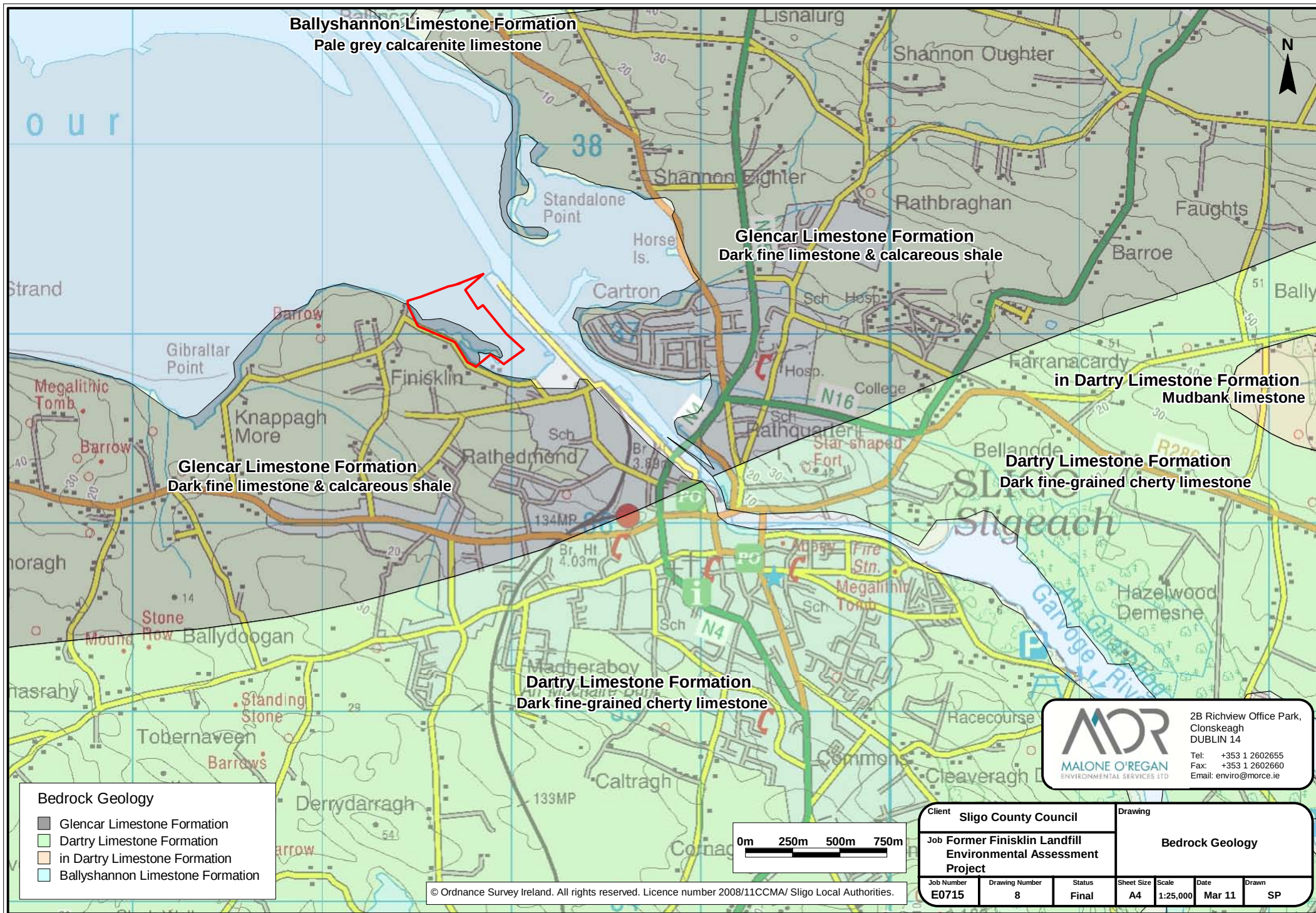
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|                                                                      |                     |                 |                                                                                               |                   |                |             |
|----------------------------------------------------------------------|---------------------|-----------------|-----------------------------------------------------------------------------------------------|-------------------|----------------|-------------|
| Client Sligo County Council                                          |                     |                 | Drawing<br>Extent of Landfill, Surrounding<br>Landuse and Hydrological Features<br>within 1km |                   |                |             |
| Job Former Finisklin Landfill<br>Environmental Assessment<br>Project |                     |                 |                                                                                               |                   |                |             |
| Job Number<br>E0715                                                  | Drawing Number<br>6 | Status<br>Final | Sht. Size<br>A3                                                                               | Scale<br>1:10,000 | Date<br>Mar 11 | Drawn<br>MS |









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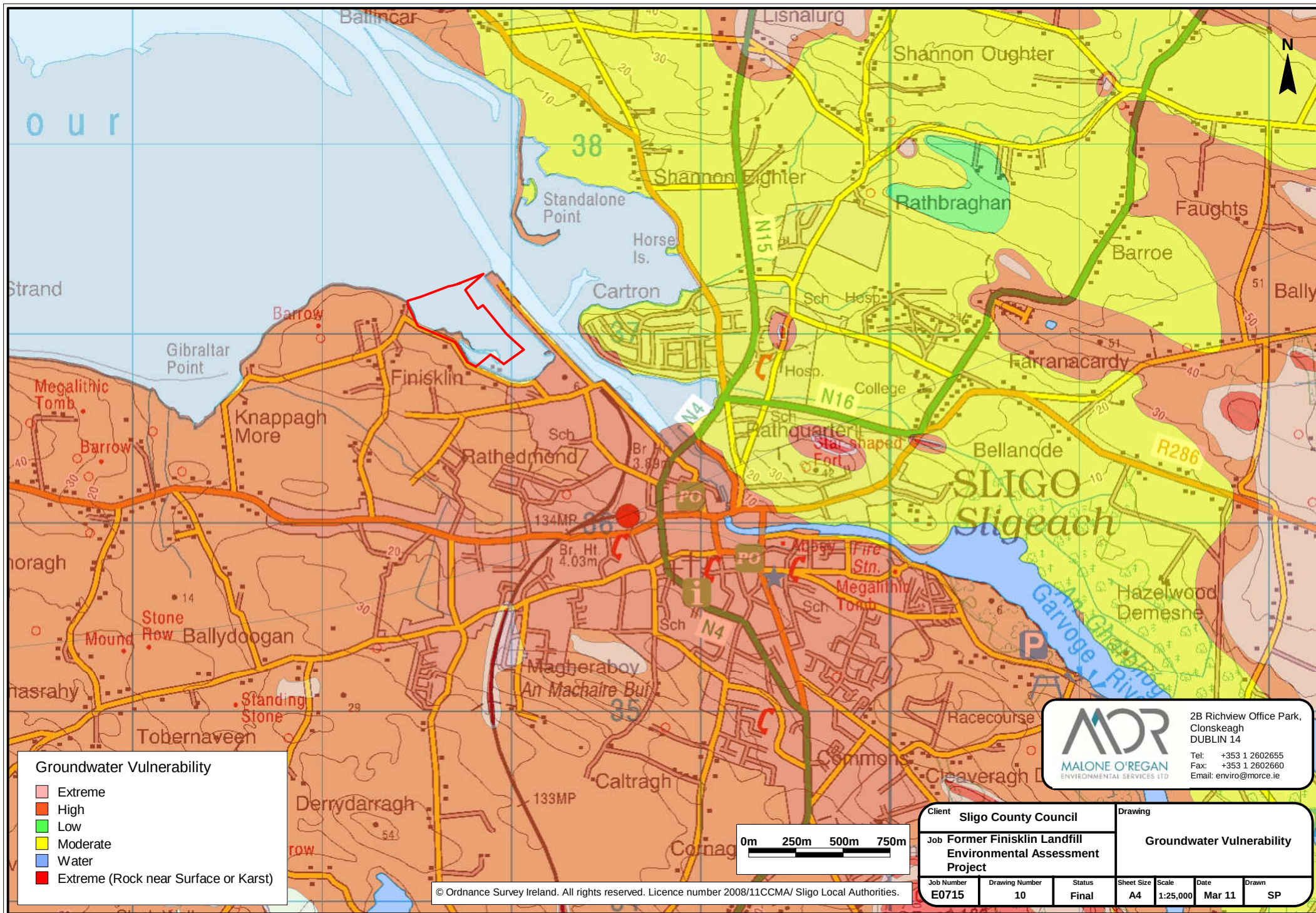
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|-----------------------------------------------------------------------|----------------------------|------------------------|-------------------------|--------------------------|-----------------------|--------------------|
| Client <b>Sligo County Council</b>                                    |                            |                        | Drawing                 |                          |                       |                    |
| Job <b>Former Finisklin Landfill Environmental Assessment Project</b> |                            |                        | <b>Bedrock Geology</b>  |                          |                       |                    |
| Job Number<br><b>E0715</b>                                            | Drawing Number<br><b>8</b> | Status<br><b>Final</b> | Sheet Size<br><b>A4</b> | Scale<br><b>1:25,000</b> | Date<br><b>Mar 11</b> | Drawn<br><b>SP</b> |









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|-------------------------------------------------------------------------------|-----------------------------|------------------------|----------------------------------|--------------------------|-----------------------|--------------------|
| Client <b>Sligo County Council</b>                                            |                             |                        | Drawing                          |                          |                       |                    |
| Job <b>Former Finisklin Landfill<br/>Environmental Assessment<br/>Project</b> |                             |                        | <b>Groundwater Vulnerability</b> |                          |                       |                    |
| Job Number<br><b>E0715</b>                                                    | Drawing Number<br><b>10</b> | Status<br><b>Final</b> | Sheet Size<br><b>A4</b>          | Scale<br><b>1:25,000</b> | Date<br><b>Mar 11</b> | Drawn<br><b>SP</b> |

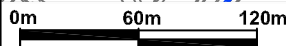
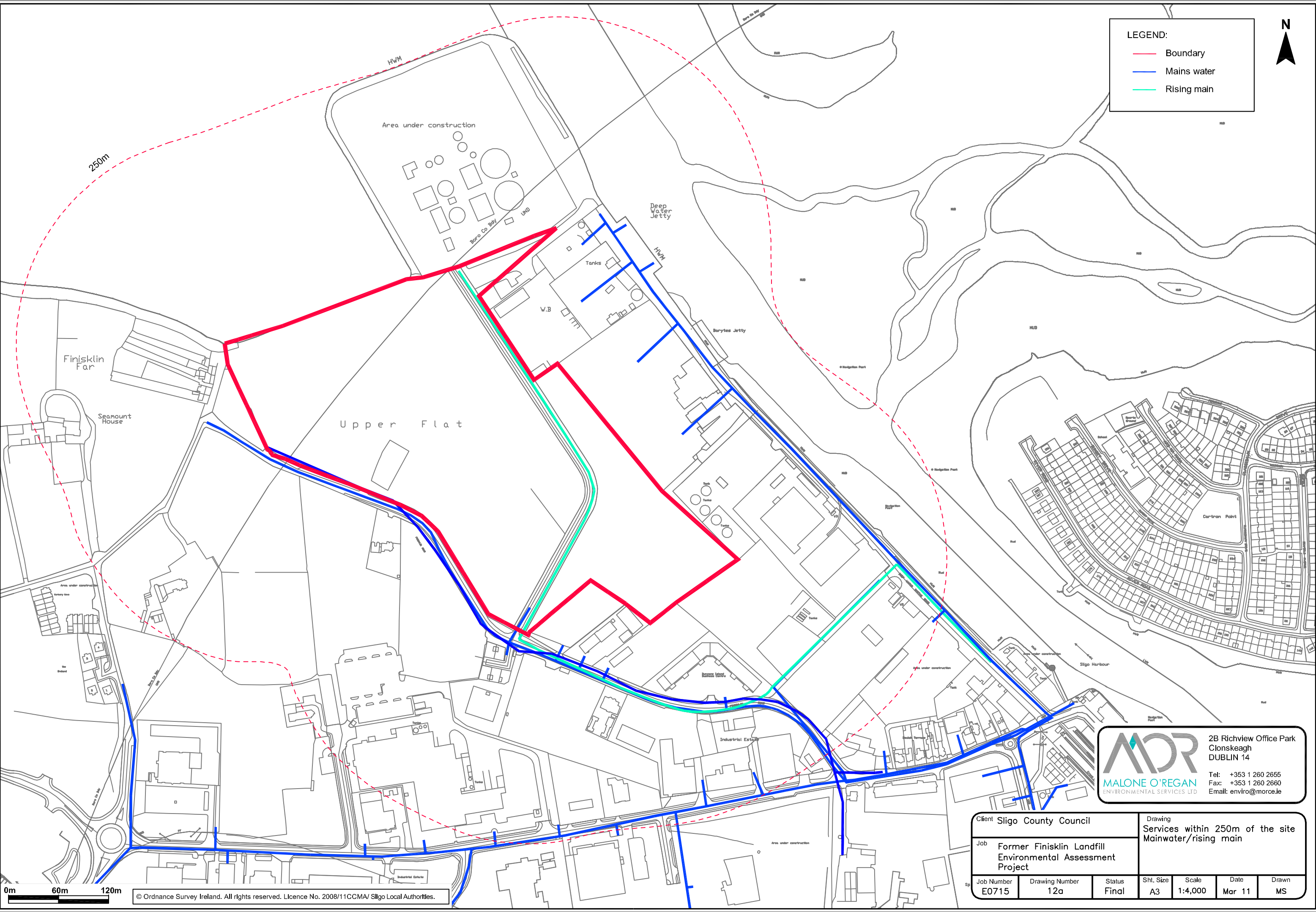






LEGEND:

- Boundary
- Mains water
- Rising main



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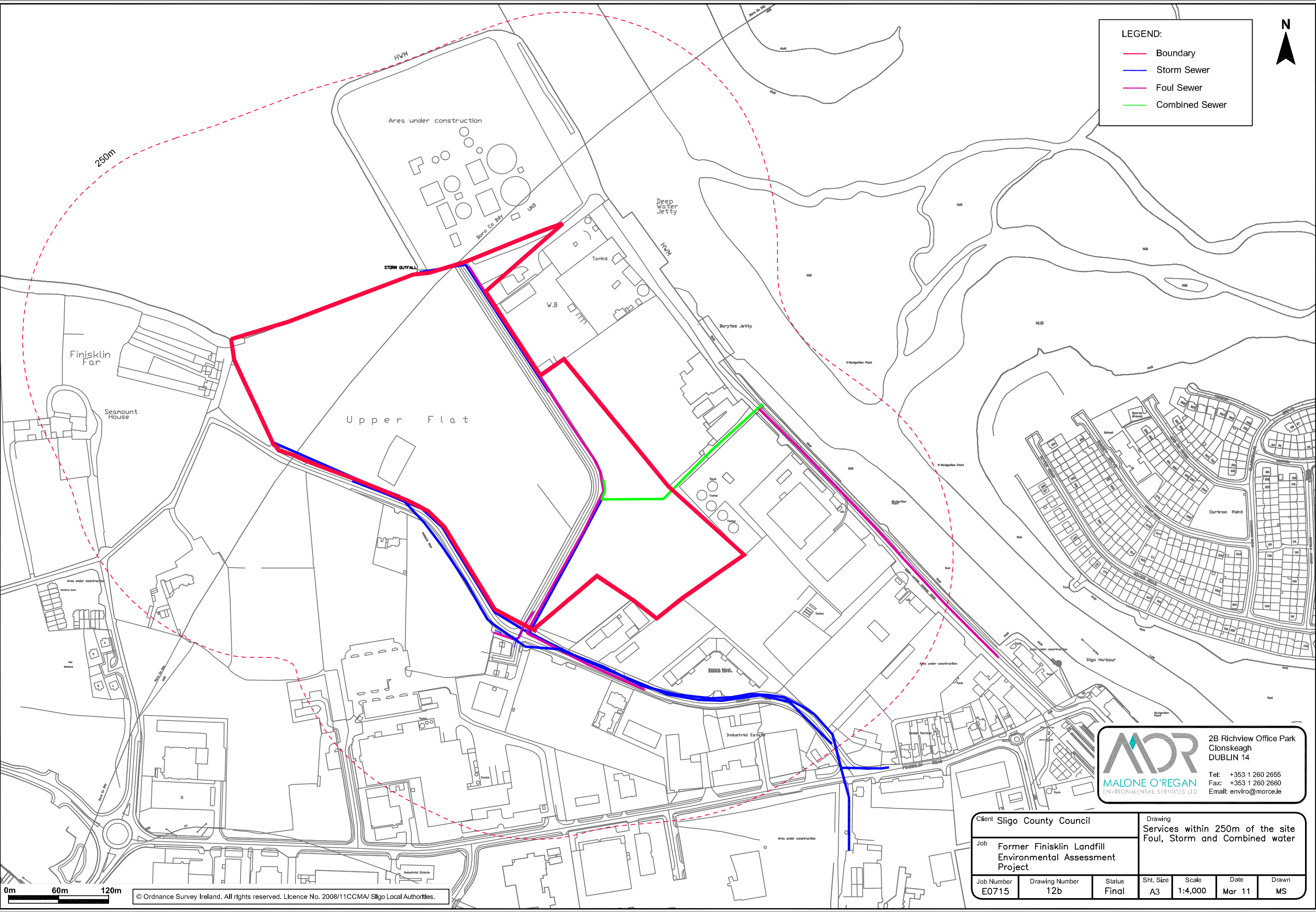
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|                                                                |                    |              |                                                                |               |             |          |
|----------------------------------------------------------------|--------------------|--------------|----------------------------------------------------------------|---------------|-------------|----------|
| Client Sligo County Council                                    |                    |              | Drawing Services within 250m of the site Mainwater/rising main |               |             |          |
| Job Former Finisklin Landfill Environmental Assessment Project |                    |              |                                                                |               |             |          |
| Job Number E0715                                               | Drawing Number 12a | Status Final | Sht. Size A3                                                   | Scale 1:4,000 | Date Mar 11 | Drawn MS |

LEGEND:

- Boundary
- Storm Sewer
- Foul Sewer
- Combined Sewer



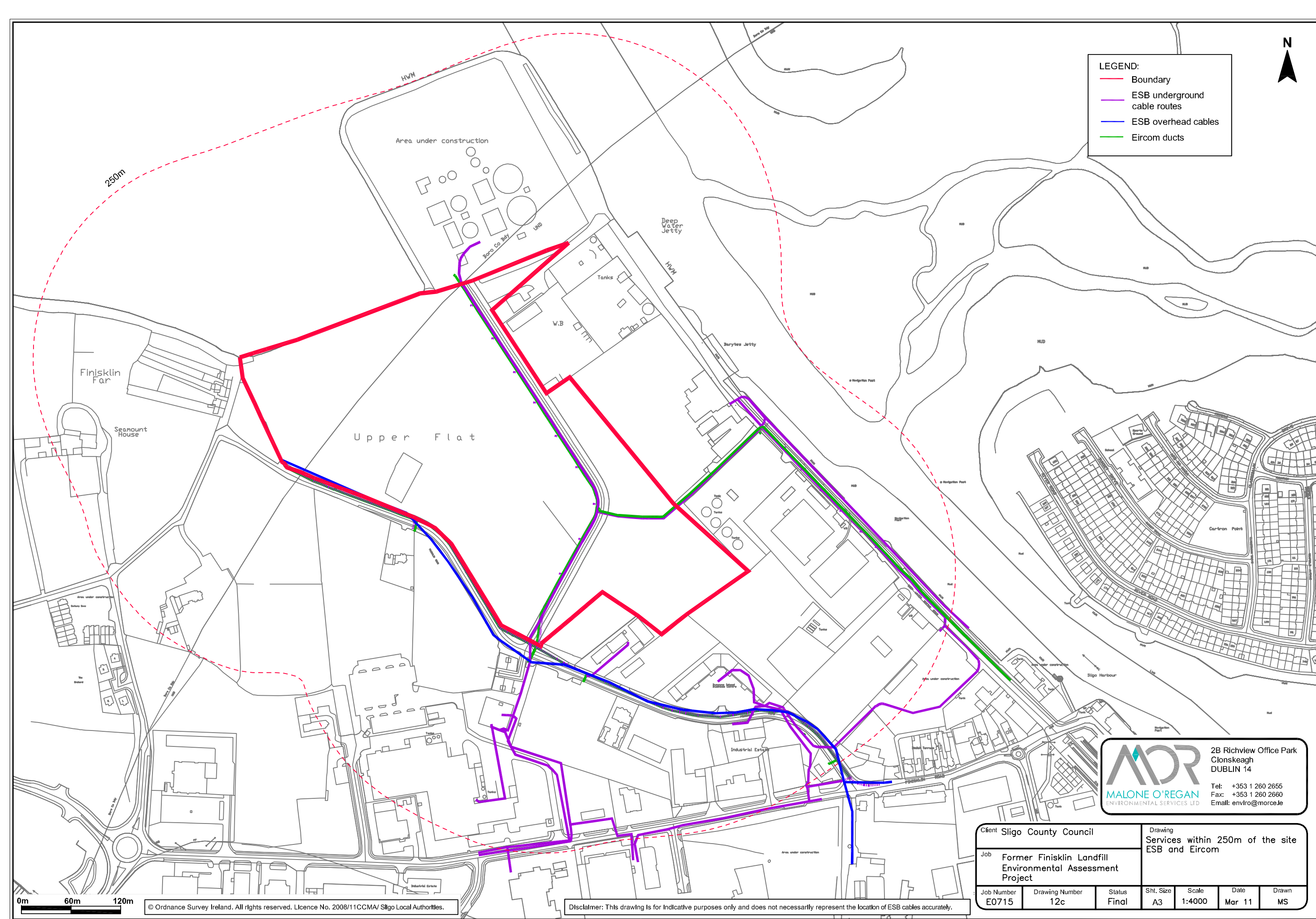
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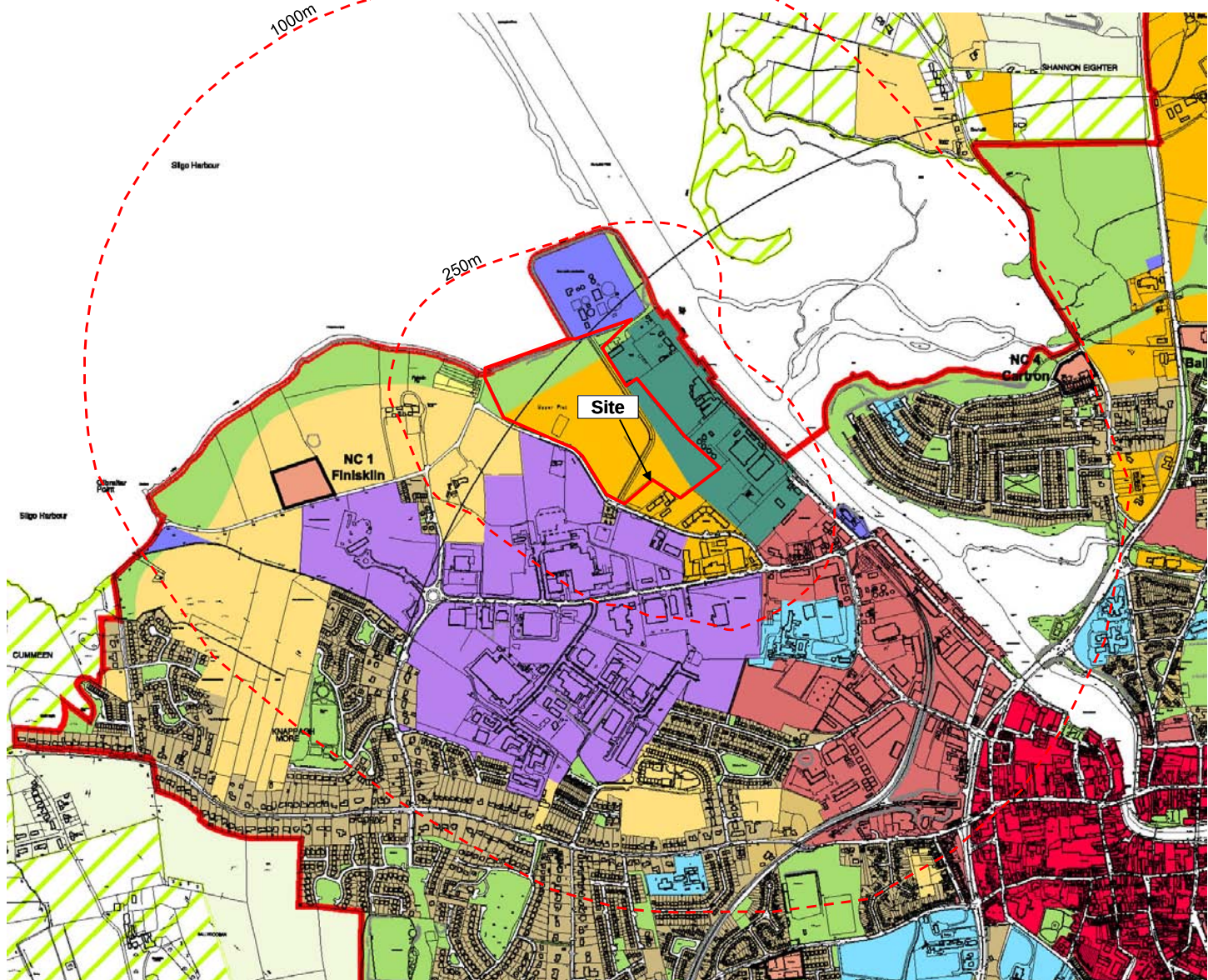
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|                                                                         |                       |                 |                                                                               |                  |                |             |
|-------------------------------------------------------------------------|-----------------------|-----------------|-------------------------------------------------------------------------------|------------------|----------------|-------------|
| Client Sligo County Council                                             |                       |                 | Drawing<br>Services within 250m of the site<br>Foul, Storm and Combined water |                  |                |             |
| Job<br>Former Finisklin Landfill<br>Environmental Assessment<br>Project |                       |                 |                                                                               |                  |                |             |
| Job Number<br>E0715                                                     | Drawing Number<br>12b | Status<br>Final | Sht. Size<br>A3                                                               | Scale<br>1:4,000 | Date<br>Mar 11 | Drawn<br>MS |









**Key**

- C1 – City Centre uses
- C2 – Commercial and mixed land uses
- MIX-1 - Mixed uses (non-retail)
- MIX-2 – Mixed uses (optional retail warehousing)
- RE – Existing residential areas
- R1 – Low density residential areas
- R2 – Low/medium density residential areas
- R3 – Medium/high density residential areas
- NC – Neighbourhood centres
- CF – Community Facilities
- RP – Retail Park
- BITP – Business, industry and technology park
- WILT – Waste management, industry, logistics, transport related uses
- PF – Port Facilities
- OS – Open space
- NR – Natural/mineral resource reservation
- PU – Public Utilities
- AA – Archeological amenity zone at Carrowmore
- BUF – Buffer zone
- GB – Green belt



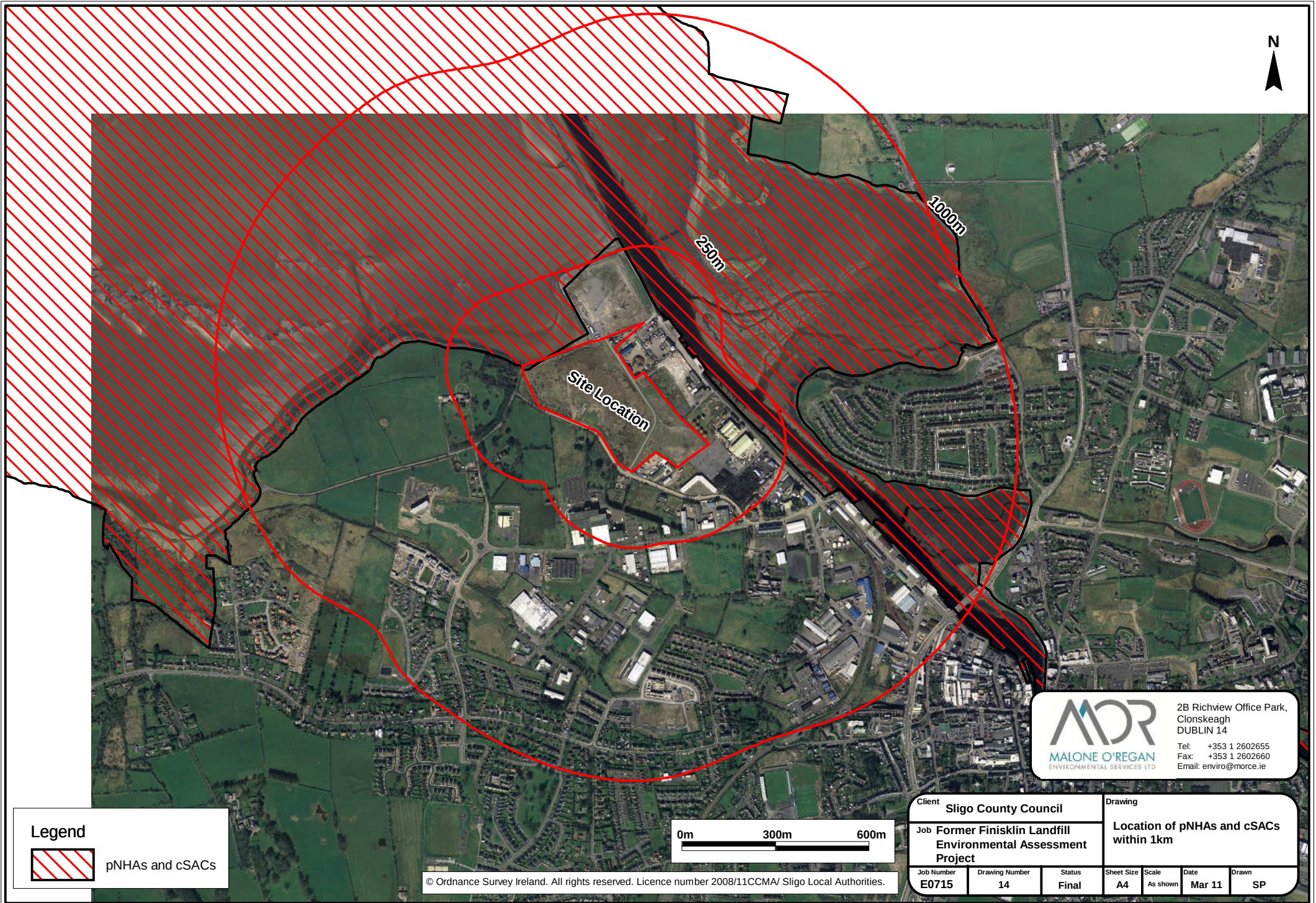


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|                                                                 |                    |               |               |                                                      |              |           |  |
|-----------------------------------------------------------------|--------------------|---------------|---------------|------------------------------------------------------|--------------|-----------|--|
| Client: Sligo County Council                                    |                    |               |               | Drawing: Sligo County Council Zoning Map (2010-2016) |              |           |  |
| Job: Former Finisklin Landfill Environmental Assessment Project |                    |               |               |                                                      |              |           |  |
| Job Number: E0715                                               | Drawing Number: 13 | Status: Final | Shr. Size: A3 | Scale: As shown                                      | Date: Mar 11 | Drawn: MS |  |





#### Legend



pNHAs and cSACs

0m 300m 600m

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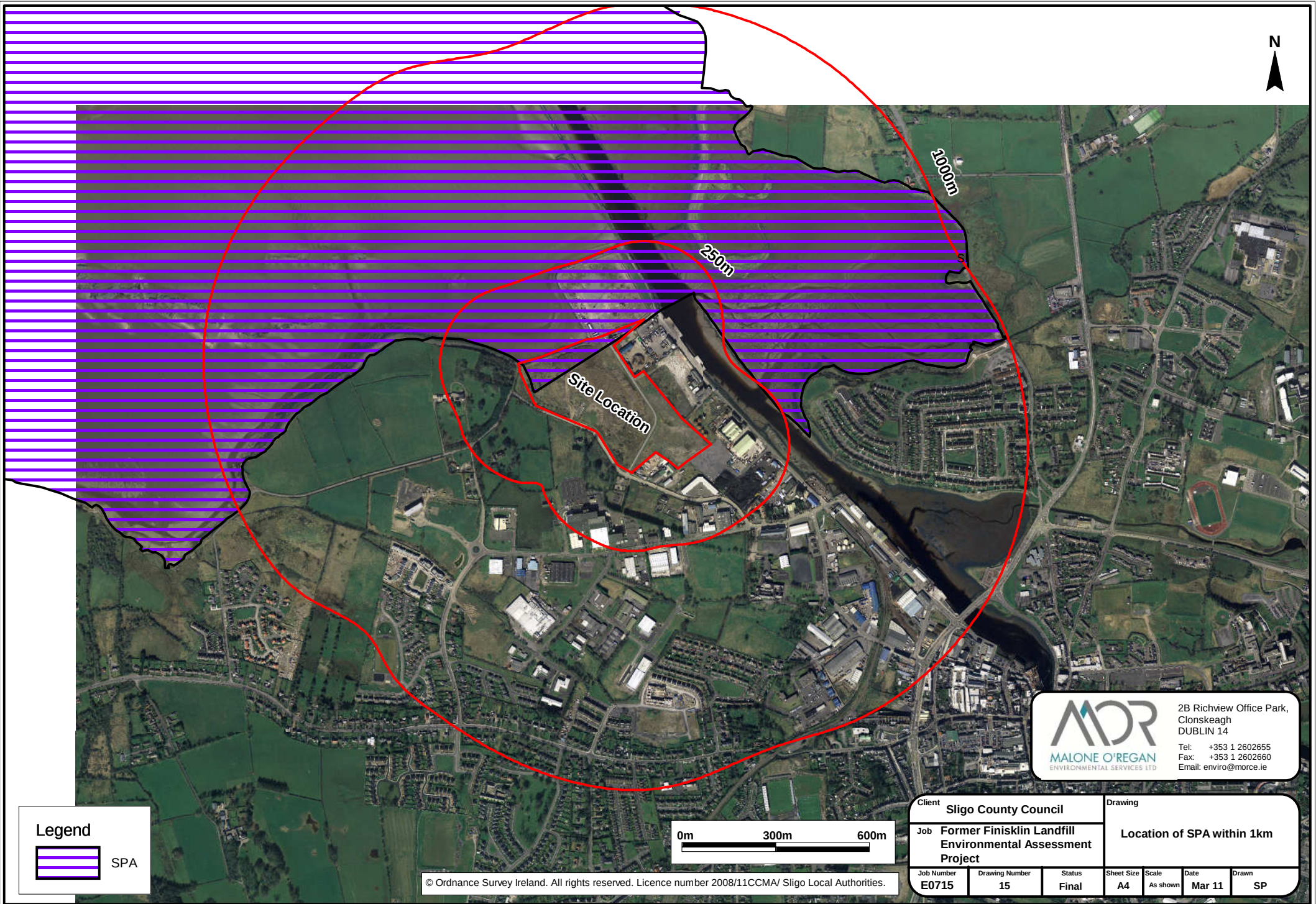


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|                                                                                  |                             |                        |                                                              |                          |                       |                    |
|----------------------------------------------------------------------------------|-----------------------------|------------------------|--------------------------------------------------------------|--------------------------|-----------------------|--------------------|
| Client<br><b>Sligo County Council</b>                                            |                             |                        | Drawing<br><b>Location of pNHAs and cSACs<br/>within 1km</b> |                          |                       |                    |
| Job<br><b>Former Finisklin Landfill<br/>Environmental Assessment<br/>Project</b> |                             |                        |                                                              |                          |                       |                    |
| Job Number<br><b>E0715</b>                                                       | Drawing Number<br><b>14</b> | Status<br><b>Final</b> | Sheet Size<br><b>A4</b>                                      | Scale<br><b>As shown</b> | Date<br><b>Mar 11</b> | Drawn<br><b>SP</b> |





Legend



SPA

0m 300m 600m

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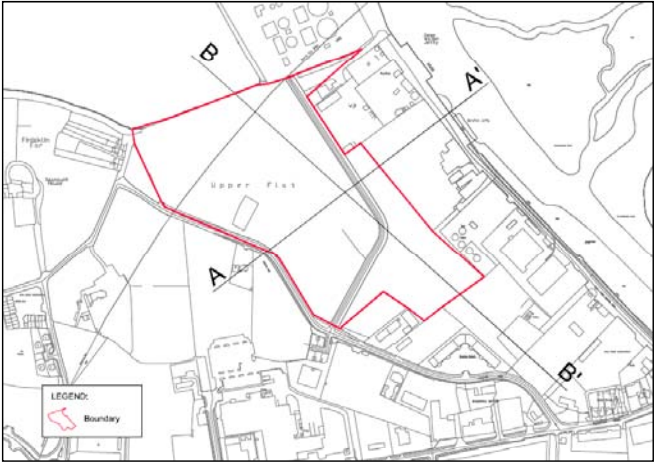
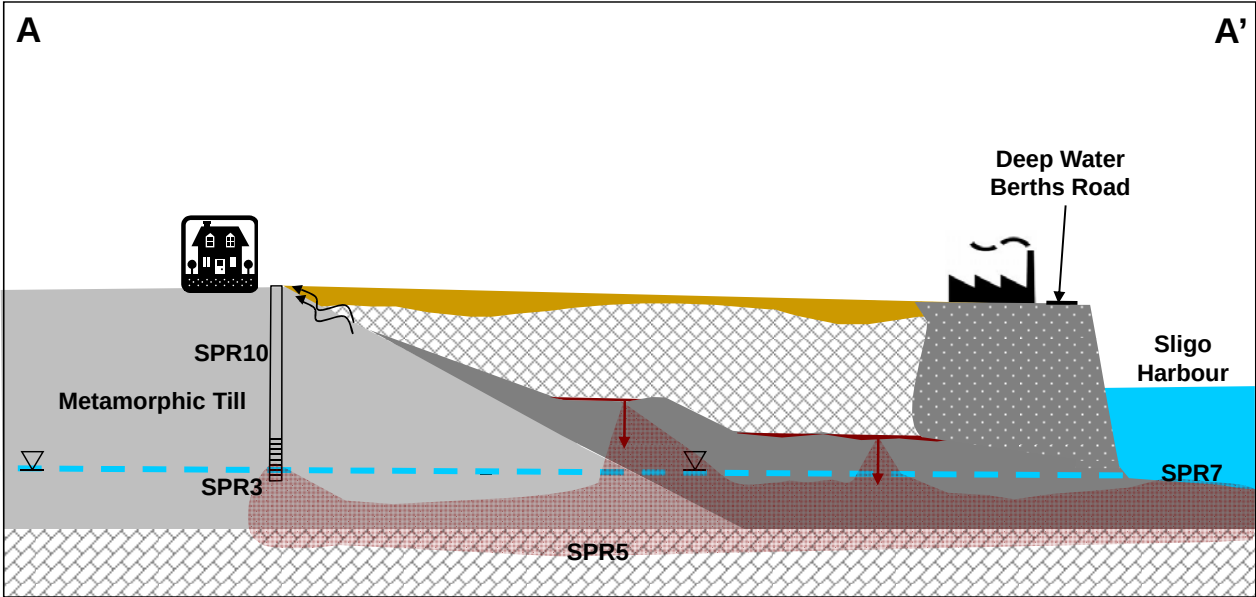


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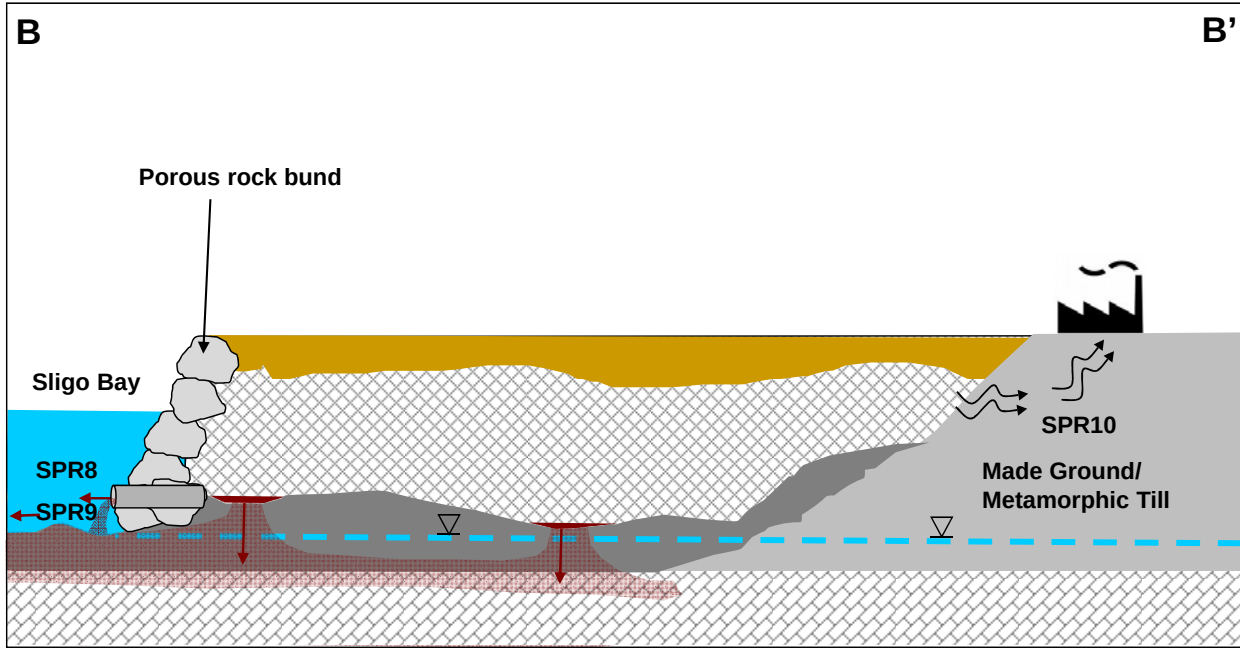
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|                                                                                  |                             |                        |                            |                          |                       |                    |
|----------------------------------------------------------------------------------|-----------------------------|------------------------|----------------------------|--------------------------|-----------------------|--------------------|
| Client<br><b>Sligo County Council</b>                                            |                             |                        | Drawing                    |                          |                       |                    |
| Job<br><b>Former Finisklin Landfill<br/>Environmental Assessment<br/>Project</b> |                             |                        | Location of SPA within 1km |                          |                       |                    |
| Job Number<br><b>E0715</b>                                                       | Drawing Number<br><b>15</b> | Status<br><b>Final</b> | Sheet Size<br><b>A4</b>    | Scale<br><b>As shown</b> | Date<br><b>Mar 11</b> | Drawn<br><b>SP</b> |

Section A-A':



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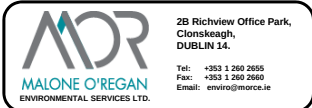


Legend:

- Landfill gas
- Leachate
- Clay capping
- Landfill material
- Leachate
- Glencar limestone formation
- Estuarine silts and clays
- Commercial/Industrial
- Residential
- Associated with Sligo Harbour reclamation and development works – potential for municipal wastes

Section B-B':

Note: This is a schematic and indicative drawing illustrating the potential SPR linkages on site



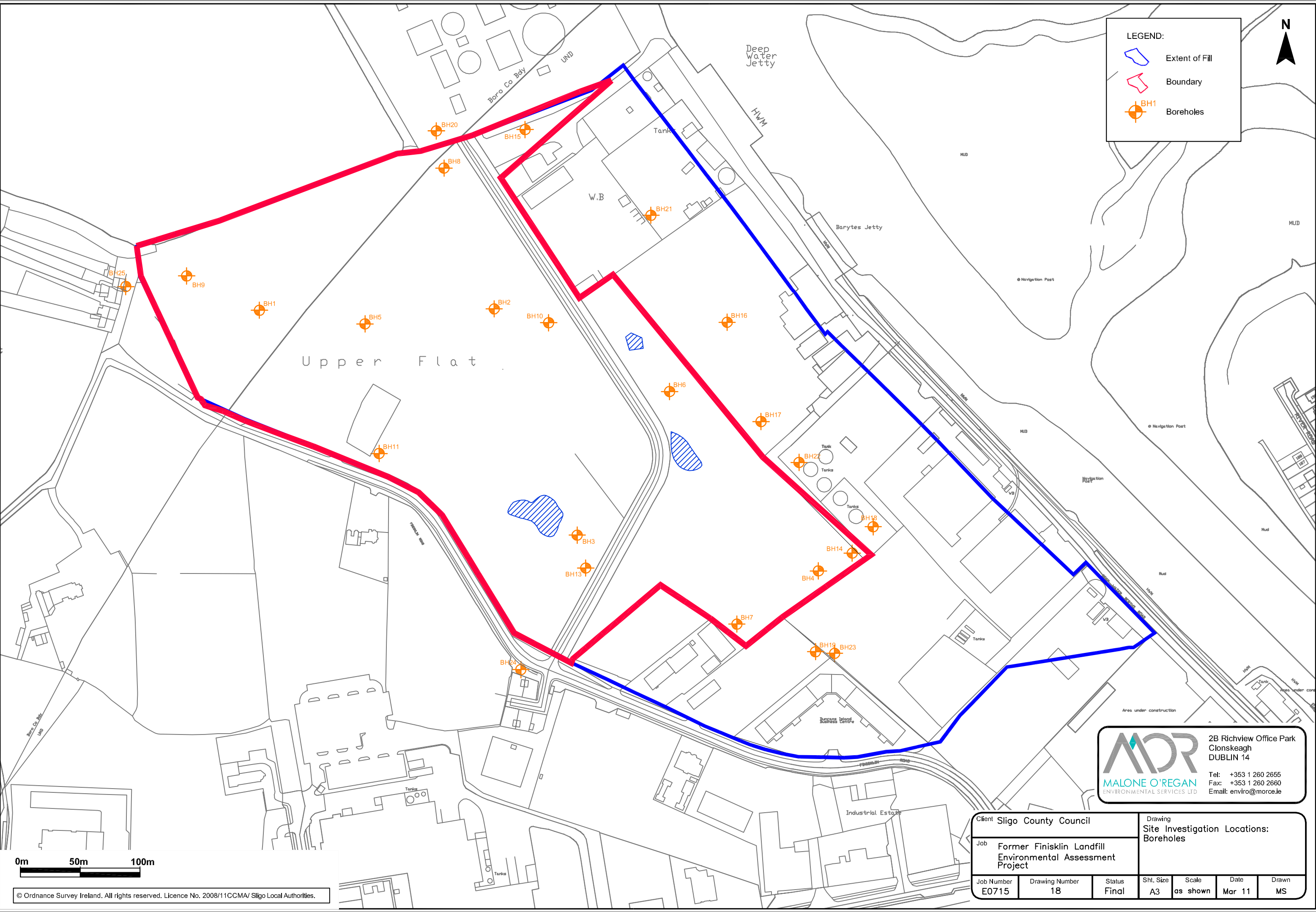
|                                                                   |                      |                                                                        |                 |
|-------------------------------------------------------------------|----------------------|------------------------------------------------------------------------|-----------------|
| Client<br>Sligo County Council                                    |                      | Drawing<br>Schematic Diagram showing Preliminary Conceptual Site Model |                 |
| Job<br>Former Finisklin Landfill Environmental Assessment Project |                      |                                                                        |                 |
| Job Number<br>E0715                                               | Drawing Number<br>16 | Status<br>Final                                                        | Sht. Size<br>A4 |
|                                                                   |                      | Scale<br>NTS                                                           | Date<br>Mar 11  |
|                                                                   |                      | Drawn<br>MS                                                            |                 |





LEGEND:

-  Extent of Fill
-  Boundary
-  Boreholes



0m 50m 100m

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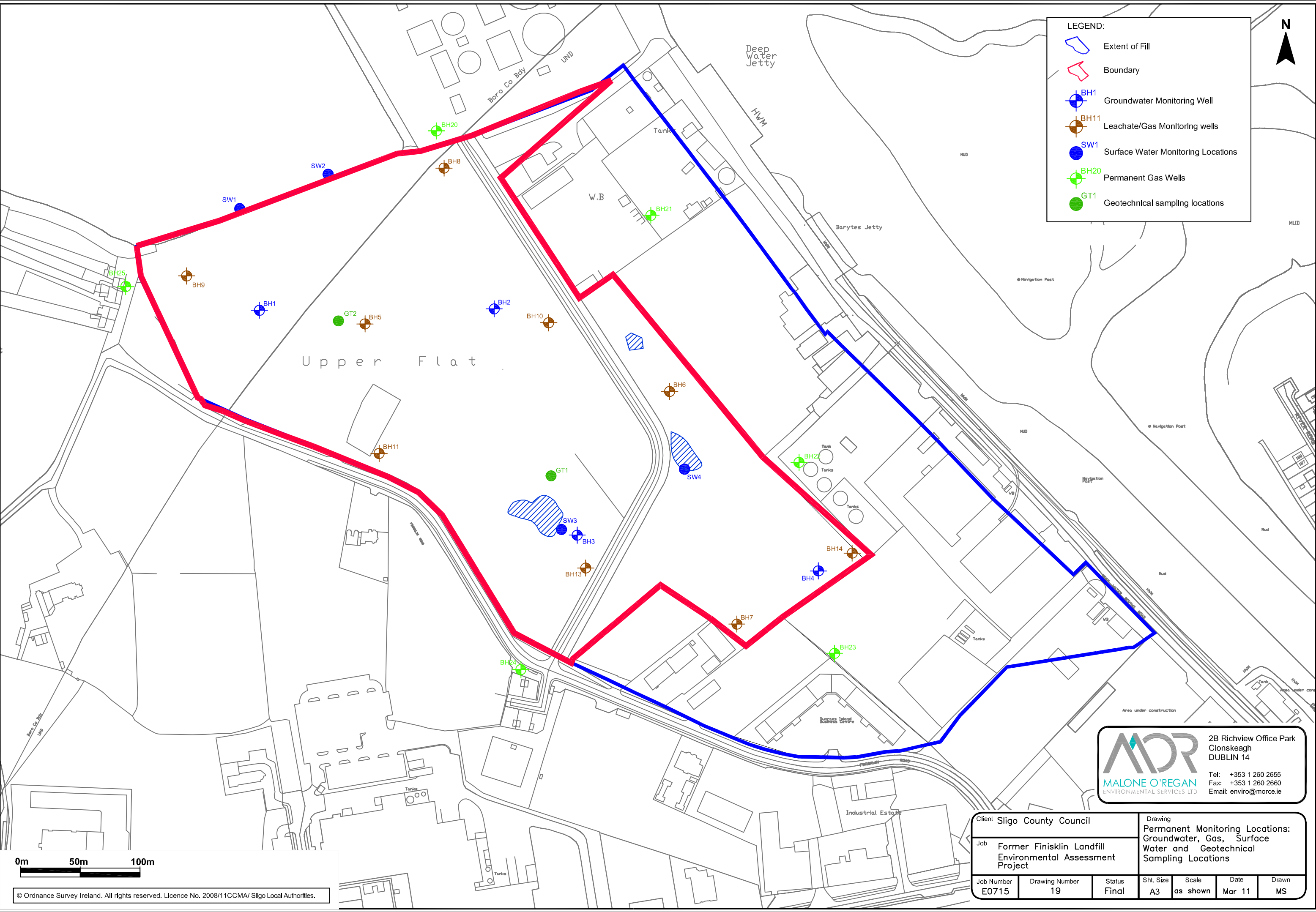
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|                                                                |                   |              |                                                 |                |             |          |
|----------------------------------------------------------------|-------------------|--------------|-------------------------------------------------|----------------|-------------|----------|
| Client Sligo County Council                                    |                   |              | Drawing Site Investigation Locations: Boreholes |                |             |          |
| Job Former Finisklin Landfill Environmental Assessment Project |                   |              |                                                 |                |             |          |
| Job Number E0715                                               | Drawing Number 18 | Status Final | Sht. Size A3                                    | Scale as shown | Date Mar 11 | Drawn MS |



LEGEND:

- Extent of Fill
- Boundary
- BH1 Groundwater Monitoring Well
- BH11 Leachate/Gas Monitoring wells
- SW1 Surface Water Monitoring Locations
- BH20 Permanent Gas Wells
- GT1 Geotechnical sampling locations



0m 50m 100m

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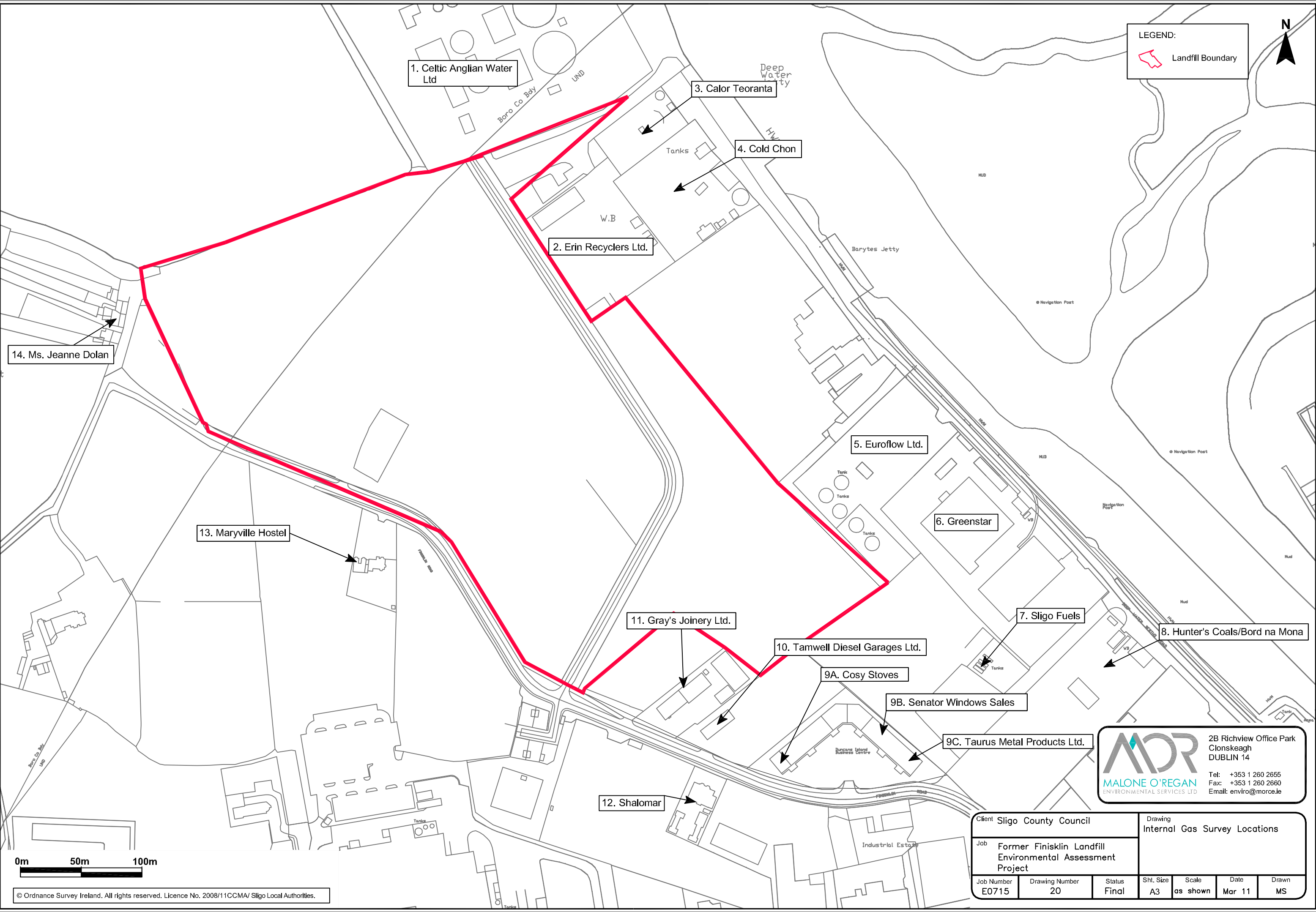
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|                                                                |                   |              |                                                                                                             |                |             |          |
|----------------------------------------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------------------------------|----------------|-------------|----------|
| Client Sligo County Council                                    |                   |              | Drawing Permanent Monitoring Locations: Groundwater, Gas, Surface Water and Geotechnical Sampling Locations |                |             |          |
| Job Former Finisklin Landfill Environmental Assessment Project |                   |              |                                                                                                             |                |             |          |
| Job Number E0715                                               | Drawing Number 19 | Status Final | Sht. Size A3                                                                                                | Scale as shown | Date Mar 11 | Drawn MS |



LEGEND:

 Landfill Boundary



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|                                                                |                   |              |                                       |                |             |          |
|----------------------------------------------------------------|-------------------|--------------|---------------------------------------|----------------|-------------|----------|
| Client Sligo County Council                                    |                   |              | Drawing Internal Gas Survey Locations |                |             |          |
| Job Former Finisklin Landfill Environmental Assessment Project |                   |              |                                       |                |             |          |
| Job Number E0715                                               | Drawing Number 20 | Status Final | Sht. Size A3                          | Scale as shown | Date Mar 11 | Drawn MS |

Low tide (15/07/2009)

High tide (29/06/2009)

LEGEND:



Extent of Fill



Boundary



Groundwater Monitoring Well



Groundwater Levels relative to Ordnance Survey datum  
(15/07/2009 and 29/06/2009)



Inferred Groundwater Flow Direction

N



0m 100m 200m

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Client Sligo County Council

Job Former Finisklin Landfill  
Environmental Assessment  
Project

Job Number  
E0715

Drawing Number  
21

Status  
Final

Sht. Size  
A3

Scale  
as shown

Date  
Mar 11

Drawn  
MS

Drawing  
Inferred Groundwater Flow Direction  
Low tide (15/07/2009)  
High tide (29/06/2009)



LEGEND:

-  Extent of Fill
-  Boundary
-  BH1 Groundwater Monitoring Well
-  BH5 Leachate/Gas Monitoring Wells
-  BH20 Gas Monitoring Wells Installed 2010

N



| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 63.5%                    | 65.5%                  | 32.2%           | 7ppm |
| M2    | 63.0%                    | 63.0%                  | 32.0%           | Oppm |
| M3    | 63.0%                    | 63.0%                  | 32.0%           | Oppm |
| M4    | 63.0%                    | 63.0%                  | 32.0%           | Oppm |
| M5    | 75.3%                    | 75.3%                  | 32.3%           | Oppm |
| M6    | 67.6%                    | 67.6%                  | 34.3%           | Oppm |
| M7    | 64.2%                    | 64.2%                  | 34.2%           | Oppm |
| M8    | 65.5%                    | 65.5%                  | 34.8%           | 1ppm |
| M9    | 65.7%                    | 65.7%                  | 35.0%           | 1ppm |
| M10   | 67.5%                    | 67.5%                  | 31.8%           | 1ppm |
| M11   | 61.4%                    | 61.4%                  | 32.5%           | 1ppm |
| M12   | 0.3%                     | 39.7%                  | 0.8%            | Oppm |
| M13   | 0.0%                     | 0.1%                   | 0.1%            | Oppm |
| M14a  | 56.3%                    | 56.3%                  | 29.9%           | Oppm |
| M14b  | 57.1%                    | 57.1%                  | 30.5%           | Oppm |
| M15   | 54.9%                    | 54.9%                  | 29.7%           | 2ppm |
| M16M  | 67.0%                    | 67.1%                  | 30.9%           | Oppm |
| M16C  | 68.0%                    | 68.1%                  | 31.1%           | 2ppm |
| M18   | 59.7%                    | 59.7%                  | 31.9%           | 3ppm |
| M19   | 58.8%                    | 58.8%                  | 31.1%           | 3ppm |
| M20   | 58.6%                    | 58.6%                  | 32.4%           | Oppm |
| M21   | 57.2%                    | 57.2%                  | 32.2%           | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 76.0%                    | 76.1%                  | 21.3%           | 3ppm |
| M2    | 80.0%                    | 80.0%                  | 14.0%           | Oppm |
| M3    | 71.0%                    | 72.0%                  | 21.0%           | Oppm |
| M4    | 74.0%                    | 74.0%                  | 21.0%           | Oppm |
| M5    | 76.3%                    | 76.3%                  | 22.8%           | Oppm |
| M6    | 72.0%                    | 72.1%                  | 23.7%           | Oppm |
| M7    | 72.3%                    | 72.4%                  | 23.7%           | 1ppm |
| M8    | 73.0%                    | 73.0%                  | 24.1%           | 1ppm |
| M9    | 73.8%                    | 74.6%                  | 23.8%           | Oppm |
| M10   | 75.2%                    | 75.7%                  | 18.2%           | Oppm |
| M11   | 67.0%                    | 67.0%                  | 18.9%           | 1ppm |
| M12   | 0.2%                     | 0.2%                   | 0.3%            | Oppm |
| M13a  | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M13b  | 2.8%                     | 2.8%                   | 0.9%            | Oppm |
| M14a  | 55.7%                    | 55.7%                  | 17.8%           | Oppm |
| M14b  | 54.9%                    | 54.9%                  | 17.9%           | Oppm |
| M14c  | 56.3%                    | 56.3%                  | 18.3%           | Oppm |
| M15   | 50.6%                    | 50.6%                  | 16.8%           | 2ppm |
| M16M  | 63.2%                    | 63.2%                  | 17.3%           | 1ppm |
| M16C  | 66.0%                    | 66.3%                  | 17.3%           | 3ppm |
| M18   | 69.2%                    | 69.3%                  | 21.0%           | Oppm |
| M19   | 69.2%                    | 69.2%                  | 21.0%           | 1ppm |
| M20   | 69.3%                    | 69.5%                  | 21.4%           | 2ppm |
| M21   | 69.6%                    | 69.6%                  | 21.5%           | 1ppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 0.0%                     | 0.0%                   | 0.0%            | 7ppm |
| M2    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M3    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M4    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M5    | 0.1%                     | 0.1%                   | 0.3%            | Oppm |
| M6    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M7    | 0.0%                     | 0.3%                   | 0.0%            | Oppm |
| M8    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M9    | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M10   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M11   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M12   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M13   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M14   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M15   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M16M  | 0.1%                     | 0.1%                   | 0.1%            | Oppm |
| M16C  | 0.1%                     | 0.2%                   | 0.1%            | Oppm |
| M18   | 0.0%                     | 0.1%                   | 0.1%            | Oppm |
| M19   | 0.3%                     | 0.7%                   | 0.3%            | Oppm |
| M20   | 0.2%                     | 0.4%                   | 0.2%            | Oppm |
| M21   | 0.1%                     | 0.1%                   | 1.0%            | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M12   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M13   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M14a  | 0.0%                     | 0.1%                   | 0.5%            | Oppm |
| M14b  | 0.0%                     | 0.2%                   | 0.5%            | Oppm |
| M15   | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M16M  | 0.0%                     | 0.0%                   | 0.8%            | Oppm |
| M16C  | 0.0%                     | 0.1%                   | 0.9%            | 3ppm |
| M18   | 0.0%                     | 0.0%                   | 1.2%            | Oppm |
| M19   | 0.0%                     | 0.0%                   | 1.4%            | Oppm |
| M20   | 0.0%                     | 0.0%                   | 1.8%            | Oppm |
| M21   | 0.0%                     | 4.0%                   | 1.5%            | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M12   | 30.9%                    | 32.4%                  | 0.7%            | Oppm |
| M13   | 43.7%                    | 44.4%                  | 1.5%            | Oppm |
| M14   | 48.2%                    | 48.4%                  | 1.8%            | Oppm |
| M15   | 55.8%                    | 58.0%                  | 1.5%            | Oppm |
| M16M  | 56.2%                    | 58.2%                  | 2.0%            | Oppm |
| M16C  | 56.5%                    | 58.5%                  | 2.0%            | 1ppm |
| M17   | 78.0%                    | 78.0%                  | 2.1%            | Oppm |
| M18   | 63.6%                    | 63.6%                  | 2.5%            | Oppm |
| M19   | 71.8%                    | 71.8%                  | 2.7%            | Oppm |
| M20   | 67.2%                    | 67.3%                  | 2.7%            | Oppm |
| M21   | 74.0%                    | 74.0%                  | 2.9%            | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 0.1%                     | 0.2%                   | 0.0%            | Oppm |
| M2    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M3    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M4    | 0.0%                     | 2.8%                   | 0.0%            | Oppm |
| M5    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M6    | 0.0%                     | 0.3%                   | 0.1%            | Oppm |
| M7    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M8    | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M9    | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M10   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M11   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M13   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M14   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M15   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M16M  | 0.1%                     | 0.1%                   | 0.1%            | Oppm |
| M16C  | 0.1%                     | 0.1%                   | 0.1%            | Oppm |
| M18   | 0.2%                     | 0.2%                   | 1.3%            | 3ppm |
| M19   | 0.0%                     | 0.0%                   | 1.2%            | 4ppm |
| M20   | 0.1%                     | 0.1%                   | 0.8%            | 2ppm |
| M21   | 0.0%                     | 0.0%                   | 0.0%            | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 80.7%                    | 81.2%                  | 14.4%           | Oppm |
| M2    | 64.0%                    | 65.0%                  | 11.0%           | Oppm |
| M3    | 0.4%                     | 0.7%                   | 0.2%            | Oppm |
| M4    | 0.1%                     | 0.1%                   | 0.0%            | Oppm |
| M5    | 76.8%                    | 76.8%                  | 12.5%           | 1ppm |
| M6    | 50.5%                    | 60.8%                  | 10.9%           | 2ppm |
| M7    | 51.2%                    | 60.5%                  | 11.2%           | 1ppm |
| M8    | 7.4%                     | 7.4%                   | 1.5%            | Oppm |
| M9    | 5.0%                     | 5.0%                   | 1.8%            | Oppm |
| M10   | 1.1%                     | 1.1%                   | 0.8%            | Oppm |
| M11   | 1.5%                     | 1.5%                   | 0.3%            | Oppm |
| M12   | 0.8%                     | 1.0%                   | 0.3%            | Oppm |
| M13   | 1.2%                     | 1.2%                   | 0.3%            | Oppm |
| M14   | 8.0%                     | 8.0%                   | 1.4%            | Oppm |
| M15   | 3.8%                     | 5.4%                   | 0.7%            | Oppm |
| M16M  | 4.3%                     | 5.0%                   | 0.7%            | Oppm |
| M16C  | 4.4%                     | 4.9%                   | 0.7%            | Oppm |
| M18   | 4.6%                     | 4.6%                   | 3.3%            | Oppm |
| M19   | 2.2%                     | 2.2%                   | 4.8%            | Oppm |
| M20   | 55.7%                    | 55.7%                  | 13.5%           | 1ppm |
| M21   | 26.8%                    | 26.8%                  | 11.8%           | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M12   | 6.2%                     | 14.4%                  | 0.8%            | Oppm |
| M13   | 0.0%                     | 0.3%                   | 0.1%            | Oppm |
| M14   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M15   | 0.0%                     | 0.0%                   | 0.0%            | Oppm |
| M16M  | 0.1%                     | 0.1%                   | 0.1%            | Oppm |
| M16C  | 0.1%                     | 0.1%                   | 0.0%            | 3ppm |
| M17   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M18   | 0.9%                     | 0.9%                   | 9.3%            | Oppm |
| M19   | 1.1%                     | 1.1%                   | 9.8%            | Oppm |
| M20   | 1.0%                     | 1.1%                   | 10.0%           | Oppm |
| M21   | 1.4%                     | 1.4%                   | 10.1%           | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 80.3%                    | 82.1%                  | 4.3%            | Oppm |
| M2    | 72.0%                    | 72.0%                  | 4.5%            | Oppm |
| M3    | 14.0%                    | 14.5%                  | 2.0%            | Oppm |
| M4    | 0.5%                     | 0.5%                   | 0.6%            | Oppm |
| M5    | 9.1%                     | 9.4%                   | 4.1%            | Oppm |
| M6    | 70.3%                    | 80.0%                  | 4.4%            | 1ppm |
| M7    | 72.2%                    | 79.8%                  | 4.2%            | 1ppm |
| M8    | 69.6%                    | 78.8%                  | 4.7%            | Oppm |
| M9    | 70.3%                    | 74.3%                  | 4.9%            | 1ppm |
| M10   | 80.4%                    | 80.4%                  | 3.9%            | Oppm |
| M11   | 12.5%                    | 12.7%                  | 2.2%            | Oppm |
| M12   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M13   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M14   | 44.5%                    | 44.5%                  | 3.1%            | Oppm |
| M15   | 4.3%                     | 4.3%                   | 2.8%            | Oppm |
| M16M  | 38.0%                    | 38.1%                  | 2.9%            | 1ppm |
| M16C  | 36.2%                    | 36.4%                  | 2.8%            | 3ppm |
| M18   | 70.4%                    | 70.4%                  | 5.3%            | 4ppm |
| M19   | 68.3%                    | 68.3%                  | 5.4%            | 2ppm |
| M20   | 67.6%                    | 67.6%                  | 5.8%            | 2ppm |
| M21   | 68.0%                    | 68.0%                  | 5.7%            | 4ppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 52.7%                    | 61.0%                  | 21.4%           | 3ppm |
| M2    | 56.0%                    | 67.0%                  | 22.0%           | Oppm |
| M3    | 59.0%                    | 59.0%                  | 23.0%           | 7ppm |
| M4    | 59.0%                    | 59.0%                  | 21.0%           | Oppm |
| M5    | 59.1%                    | 61.2%                  | 21.0%           | Oppm |
| M6    | 51.5%                    | 51.5%                  | 24.0%           | Oppm |
| M7    | 51.9%                    | 51.9%                  | 24.1%           | Oppm |
| M8    | 51.5%                    | 51.5%                  | 24.5%           | 1ppm |
| M9    | 50.4%                    | 50.4%                  | 24.5%           | Oppm |
| M10   | 51.0%                    | 51.0%                  | 20.4%           | Oppm |
| M11   | 46.8%                    | 46.8%                  | 19.9%           | Oppm |
| M12   | 22.3%                    | 22.3%                  | 14.0%           | Oppm |
| M13   | 45.3%                    | 45.3%                  | 18.7%           | Oppm |
| M14   | 42.7%                    | 42.7%                  | 18.9%           | Oppm |
| M15   | 44.4%                    | 44.4%                  | 18.8%           | 1ppm |
| M16M  | 49.7%                    | 49.7%                  | 19.3%           | Oppm |
| M16C  | 50.1%                    | 50.1%                  | 18.8%           | 2ppm |
| M18   | 44.1%                    | 44.1%                  | 20.2%           | Oppm |
| M19   | 43.4%                    | 43.4%                  | 20.7%           | Oppm |
| M20   | 43.3%                    | 43.3%                  | 20.6%           | Oppm |
| M21   | 43.6%                    | 43.6%                  | 20.6%           | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO     |
|-------|--------------------------|------------------------|-----------------|--------|
| M12   | 10.0%                    | 18.0%                  | 1.0%            | 243ppm |
| M13   | 13.4%                    | 18.8%                  | 0.7%            | 73ppm  |
| M14   | 36.7%                    | 36.7%                  | 4.1%            | Oppm   |
| M15   | 36.7%                    | 36.7%                  | 4.1%            | Oppm   |
| M16M  | 11.3%                    | 15.4%                  | 3.2%            | Oppm   |
| M16C  | 11.2%                    | 13.4%                  | 3.0%            | 2ppm   |
| M17   | 29.2%                    | 29.2%                  | 10.0%           | Oppm   |
| M18   | 81.4%                    | 81.4%                  | 6.1%            | 1ppm   |
| M19   | 74.8%                    | 75.5%                  | 6.9%            | Oppm   |
| M20   | 78.9%                    | 78.5%                  | 7.3%            | 1ppm   |
| M21   | 78.5%                    | 78.9%                  | 7.6%            | Oppm   |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M1    | 0.0%                     | 0.0%                   | 10.7%           | Oppm |
| M2    | 0.0%                     | 0.0%                   | 8.2%            | Oppm |
| M3    | 0.0%                     | 0.0%                   | 11.0%           | Oppm |
| M4    | 0.0%                     | 0.0%                   | 9.6%            | Oppm |
| M5    | 0.0%                     | 0.3%                   | 11.3%           | Oppm |
| M6    | 0.0%                     | 0.0%                   | 10.8%           | Oppm |
| M7    | 0.0%                     | 0.0%                   | 11.1%           | Oppm |
| M8    | 0.0%                     | 0.0%                   | 10.8%           | Oppm |
| M9    | 0.0%                     | 0.0%                   | 10.5%           | Oppm |
| M10   | 0.0%                     | 0.0%                   | 3.3%            | Oppm |
| M11   | 0.0%                     | 0.0%                   | 3.7%            | Oppm |
| M12   | 0.0%                     | 0.0%                   | 3.8%            | Oppm |
| M13   | 0.0%                     | 0.0%                   | 3.9%            | Oppm |
| M14   | 0.0%                     | 0.0%                   | 4.3%            | Oppm |
| M15   | 0.0%                     | 0.0%                   | 4.9%            | Oppm |
| M16M  | 0.0%                     | 0.0%                   | 5.2%            | Oppm |
| M16C  | 0.0%                     | 0.0%                   | 5.2%            | Oppm |
| M18   | 0.0%                     | 0.0%                   | 8.5%            | Oppm |
| M19   | 0.0%                     | 0.0%                   | 9.1%            | Oppm |
| M20   | 0.0%                     | 0.1%                   | 9.2%            | Oppm |
| M21   | 0.0%                     | 0.0%                   | 9.5%            | Oppm |

| Event | CH <sub>4</sub> (stable) | CH <sub>4</sub> (peak) | CO <sub>2</sub> | CO   |
|-------|--------------------------|------------------------|-----------------|------|
| M12   | 0.0%                     | 0.0%                   | 0.1%            | Oppm |
| M13   | 0.0%                     | 0.0%                   | 0.3%            | Oppm |
| M14   | 0.0%                     | 0.0%                   | 1.5%            | Oppm |
| M15   | 0.0%                     | 0.0%                   | 2.2%            | Oppm |
| M16M  | 0.1%                     | 0.3%                   | 2.0%            | Oppm |
| M16C  | 0.1%                     | 0.2%                   | 2.1%            | Oppm |
| M17   | 0.0%                     | 0.0%                   | 2.0%            | Oppm |
| M18   | 0.0%                     | 0.1%                   | 1.3%            | Oppm |
| M19   | 0.0%                     | 0.0%                   | 0.4%            | Oppm |
| M20   | 0.0%                     | 0.0%                   | 2.1%            | Oppm |
| M21   | 0.0%                     | 0.0%                   | 2.7%            | Oppm |



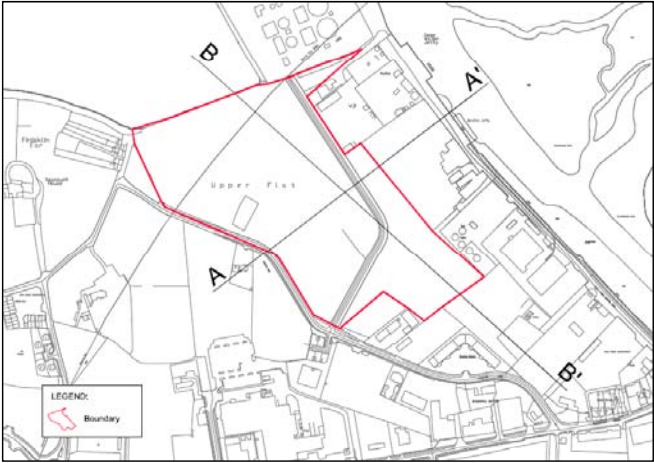
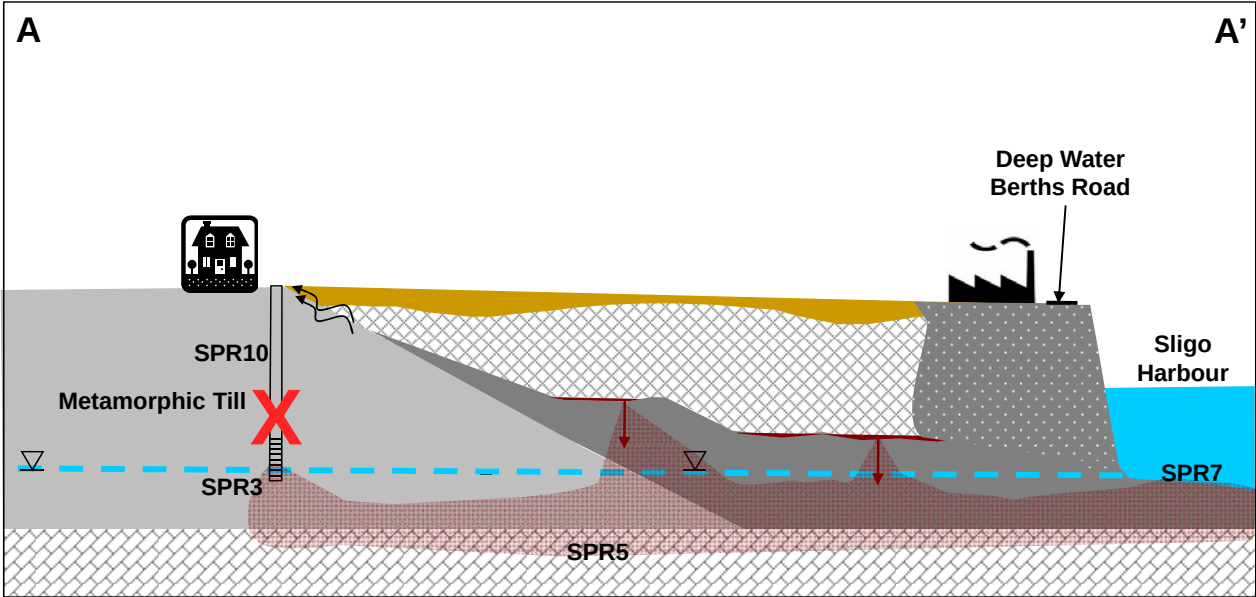
2B Richview Office Park  
Clonskeagh  
DUBLIN 14

Tel: +353 1 260 2655  
Fax: +353 1 260 2660  
Email: [enviro@mor.ie](mailto:enviro@mor.ie)

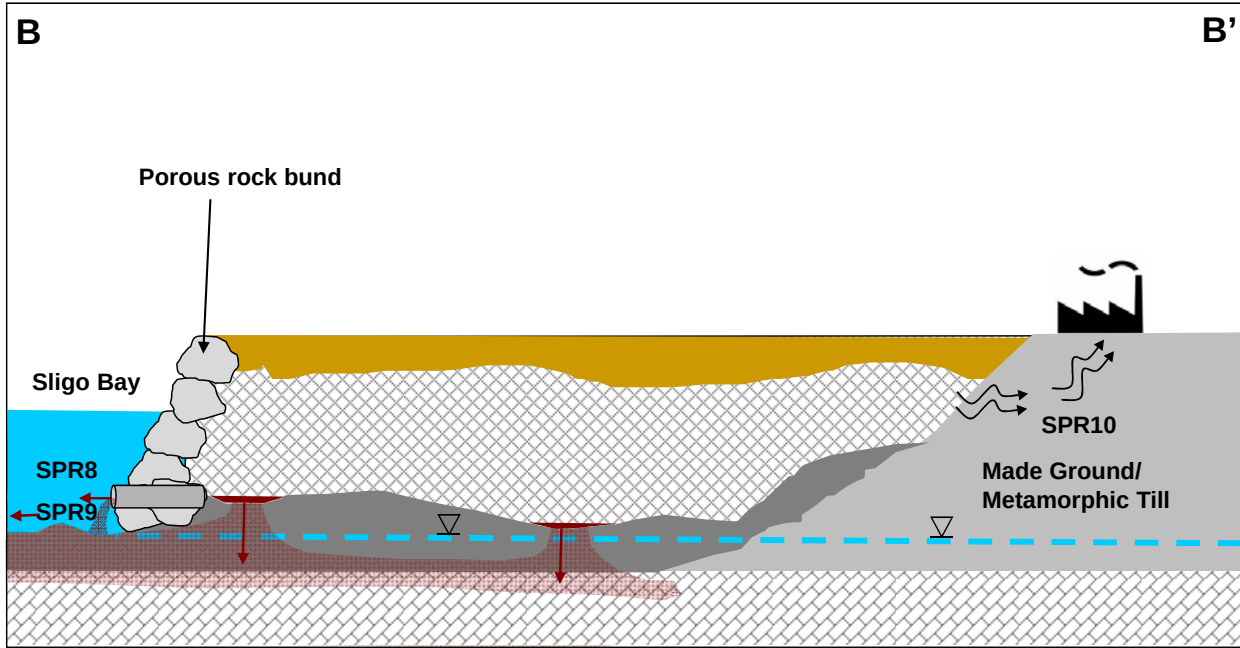
|                                                                |                   |              |                                         |                |             |          |
|----------------------------------------------------------------|-------------------|--------------|-----------------------------------------|----------------|-------------|----------|
| Client Sligo County Council                                    |                   |              | Drawing Landfill Gas Monitoring Results |                |             |          |
| Job Former Finisklin Landfill Environmental Assessment Project |                   |              |                                         |                |             |          |
| Job Number E0715                                               | Drawing Number 22 | Status Final | Sht. Size A3                            | Scale as shown | Date Mar 11 | Drawn MS |



Section A-A':



Ordnance Survey Ireland No. EN0002510 © Ordnance Survey Ireland and Government of Ireland

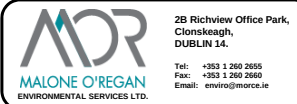


Legend:

- Landfill gas
- Leachate
- Clay capping
- Landfill material
- Leachate
- Glencar limestone formation
- Estuarine silts and clays
- Commercial/Industrial
- Residential
- Associated with Sligo Harbour reclamation and development works – potential for municipal wastes

Section B-B':

Note: This is a schematic and indicative drawing illustrating the potential SPR linkages on site



|                                                                   |                      |                 |                 |                                                                    |                |             |  |
|-------------------------------------------------------------------|----------------------|-----------------|-----------------|--------------------------------------------------------------------|----------------|-------------|--|
| Client<br>Sligo County Council                                    |                      |                 |                 | Drawing<br>Revised Schematic Diagram showing Conceptual Site Model |                |             |  |
| Job<br>Former Finisklin Landfill Environmental Assessment Project |                      |                 |                 |                                                                    |                |             |  |
| Job Number<br>E0715                                               | Drawing Number<br>23 | Status<br>Final | Sht. Size<br>A4 | Scale<br>NTS                                                       | Date<br>Mar 11 | Drawn<br>MS |  |

# Photographs



**Photograph 1:** View looking north east along rock armour on northern boundary



**Photograph 2:** View looking north east towards the WWTP



**Photograph 3:** View looking north across Sligo Bay from northern boundary. Please note outfall in foreground.



**Photograph 4:** View looking north east across site



**Photograph 5:** View looking east across the northern section of the site



**Photograph 6:** View across the site looking north west towards Sligo Bay





**Photograph 7:** View looking east. Please note capping layer/material in foreground.



**Photograph 8:** View looking south east along access road



**Photograph 9:** View looking north from secondary site entrance



**Photograph 10:** View looking north east from access road. Please note ponded water in foreground.





**Photograph 11:** View looking south-east from the access road



**Photograph 12:** View looking north east at the main entrance to the WWTP located off Finisklin road



**Photograph 13: Trial Pit No. 2**

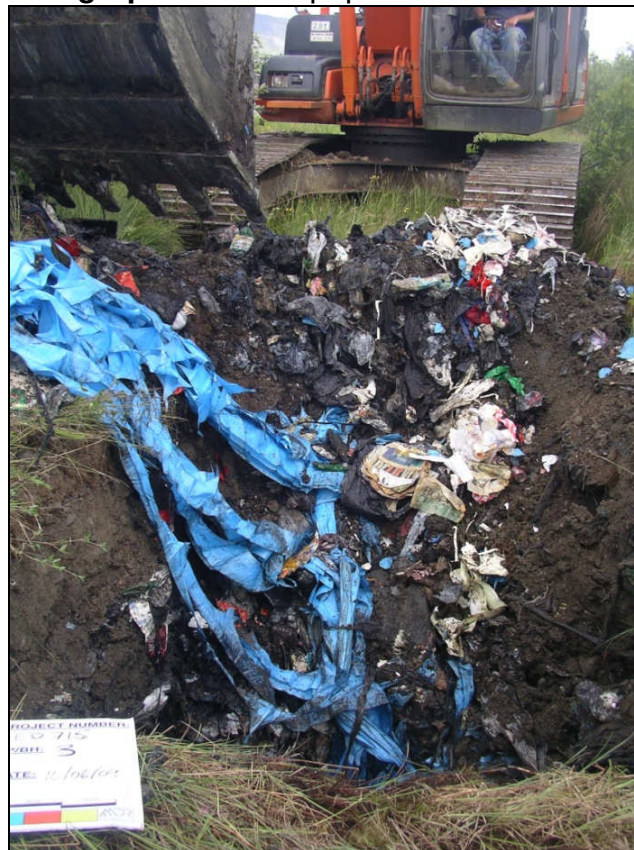


**Photograph 14: Newspaper from Trial Pit No. 3**





**Photograph 15:** Newspaper from Trial Pit No. 3



**Photograph 16:** Trial Pit No. 3





**Photograph 17: Trial Pit No. 4**



**Photograph 18: Trial Pit No. 5**





**Photograph 19: Trial Pit No. 6**



**Photograph 20: Trial Pit No. 10**





**Photograph 21: Trial Pit No. 1**



**Photograph 22: Trial Pit No. 14**



**Photograph 23: Trial Pit No. 19**



**Photograph 24: Trial Pit No. 20**





**Photograph 25: Trial Pit No. 22**

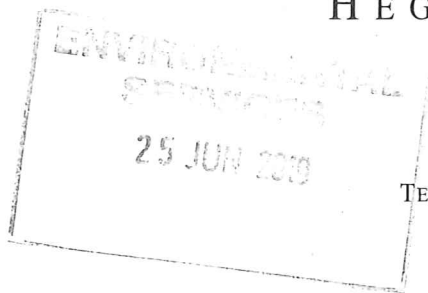


# APPENDIX A





HEGARTY & ARMSTRONG  
SOLICITORS



TOP FLOOR, MILLENNIUM HOUSE,  
STEPHEN STREET, SLIGO, IRELAND.  
TELEPHONE: 071-9142648. FAX: 071-9145839.  
e-mail: h&asolicitors@millehouse.com  
DX 5 022

Our Ref 79/10/A/BA

Your Ref

23 June 2010

**Re: Finisklin Landfill**

~~~~~

Dear Paul

I refer to your letter dated 9<sup>th</sup> June 2010 and to our meeting on the 16<sup>th</sup> June 2010.

What is at issue here is the extent of the obligations on Sligo County Council under the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (SI No 524/2008).

The definition of a "closed Landfill", to which the obligation applies, in Article (3) of the Regulations is as follows:-

*"closed landfill" means a landfill site operated by a local authority for the recovery or disposal of waste without a waste licence on any date between 15<sup>th</sup> July 1977 and 27<sup>th</sup> March 1997.....*

The Finisklin site was originally formed following the extension seawards of the Deepwater Port at Sligo. Basically what happened was that the port was built in a line north westwards from Sligo Town leaving a shallow foreshore area between it and the original coast line at Finisklin. As this extended part of the port is not shown on the 1875 Ordnance Survey Map it is clear that the work was done after that date. Following the construction of the extension, the foreshore area behind it began to get used by the community of the time for the disposal of waste in a rather unregulated way.

I enclose a copy of a map prepared at the time of the takeover of Sligo Harbour by Sligo County Council from the former Sligo Harbour Commissioners which was intended to show how the various sections of land were acquired by the Commissioners and a schedule of the transactions to which the references from HA 4 to HA 10 refer.

BRYAN ARMSTRONG B.C.L., DECLAN HEGARTY B.A., EOIN ARMSTRONG B.C.L.,  
ÁINE MULDERRIG B.C.L. ÉILEÁIN CUNNINGHAM B.A.I.L.L.B.

As can be seen from the map the area marked HA 5 was leased by the Minister for Finance to Sligo Harbour Commissioners in 1958 and the area marked HA 6 was leased by the Minister for Transport to the Commissioners in 1967. (The irregularly shaped areas were islands within the now filled in areas of foreshore.)

I believe that the areas then leased (ie HA 5 and HA 6) had been filled in before the 15<sup>th</sup> July 1977. I say that because part of HA 5 was subleased by the Commissioners in 1968 to an operation that was to import fuel through the Port and part of HA 6 was leased to a car recycling operation with effect from the 1<sup>st</sup> December 1978 and it must have been completed well before that. Also neither Sligo Corporation nor Sligo County Council had an interest in these parts of the site and there must be a question as to whether or not either could be said to have "operated" it. The Sligo Harbour Commissioners were not a Local Authority and were abolished in 2006.

The area described as HA 9 on this map was leased by the Minister for Transport to Sligo Harbour Commissioners in 1983 and was subleased by the Commissioners to Sligo Corporation the same year. The intent behind these leases was to provide for an extension to the Finisklin Landfill which would be operated by the Corporation. Although I was not involved in the matter as I did not act for the Corporation at the time, it was common knowledge that by then the use of the HA 9 area as a landfill had been under way for some time and that it was an effort to regularise an already existing situation.

I have been shown the map prepared by Malone O'Regan Environmental Services Limited showing the general area outlined in red and blue. The red area shows the part of the Finisklin land which is intended to be the subject of the Certification procedure under the Regulations and the blue shows the older part of the area which has been the subject of the earlier filling activity.

The red area includes all of the area which was the subject of the 1983 sublease to Sligo Corporation (and was therefore undoubtedly operated by the Local Authority) and also includes a section to the east about which there may be some doubt. In my view Certification of this area meets and probably exceeds the obligations of the Local Authorities under the regulations. It is proper to exclude the area outlined in blue because it was filled prior to the 15<sup>th</sup> July 1977 and in any event does not appear to have been operated by a Local Authority.

Yours sincerely

A handwritten signature in black ink, appearing to read 'B. Armstrong', written over a horizontal line.

BRYAN ARMSTRONG  
HEGARTY & ARMSTRONG

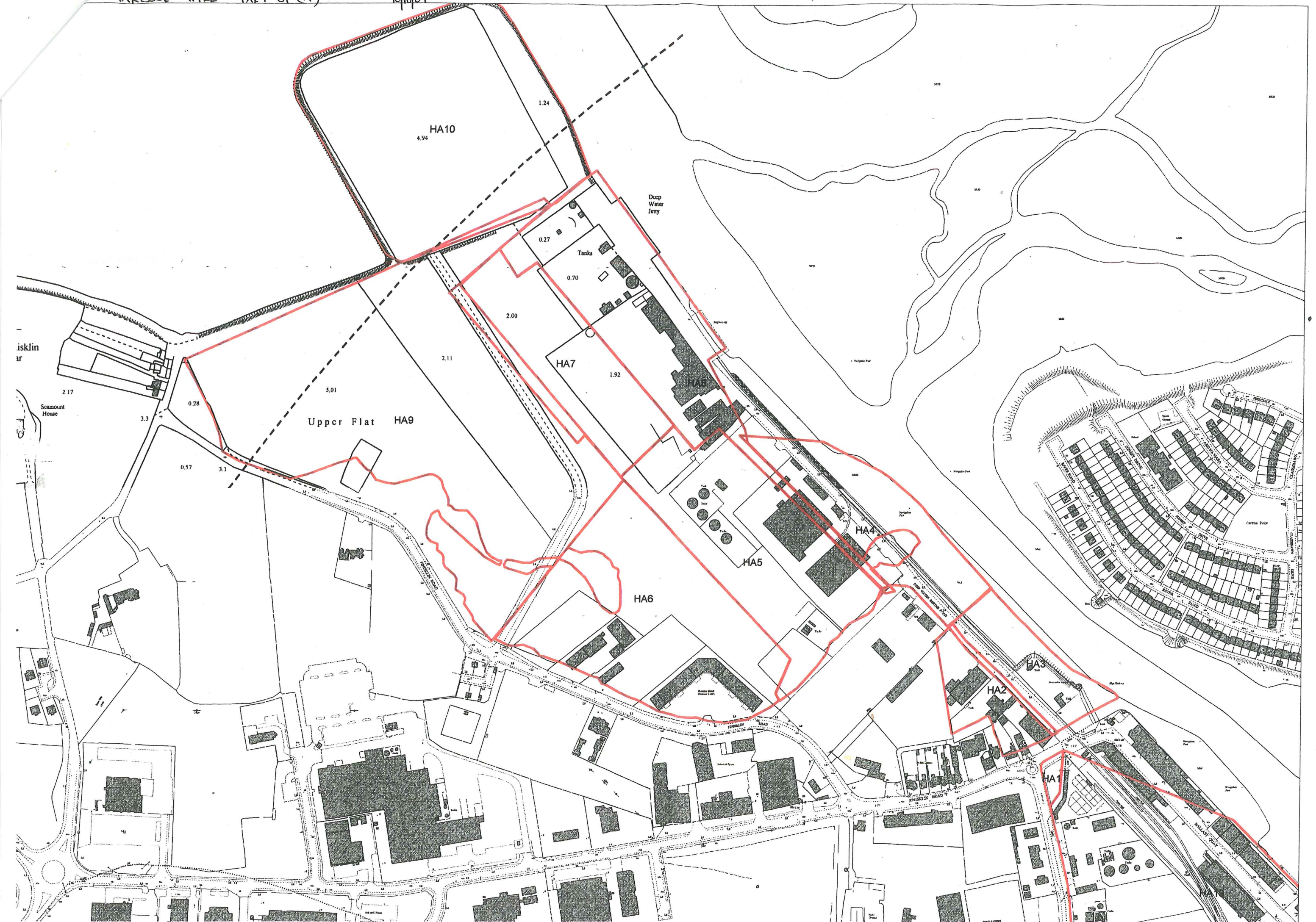
Mr Paul Hampson  
Senior Executive Engineer  
Sligo County Council  
Environment Section  
Cleveragh  
Sligo

Enc

# HARBOR TITLE

| Harbour_id | Document_no | Title                                                                | Title_2                                          | Property_a |
|------------|-------------|----------------------------------------------------------------------|--------------------------------------------------|------------|
| HA1        |             | Convey 31/07/1900 T. Barrett & Others to SHC                         |                                                  |            |
| HA2        |             | Convey 31/07/1900 T Barrett & Others to SHC                          |                                                  |            |
| HA3        |             | Convey 16/09/1880 T Barrett to SHC                                   | Plot 8 & 9 convey 11/09/1880 WT Vernon to SHC    |            |
| HA4        |             | Convey 11/09/1880 WT Vernon to SHC                                   |                                                  |            |
| HA5        |             | Lese 17/11/1958 Minstr Finance to SHC                                | Convey 14/01/1999 Minstr Finance to SHC          |            |
| HA6        |             | Lese 20/9/1967 Minstr Transport & Marine,                            | Convey 24/12/1993 Minstr Marine & Finance to SHC |            |
| HA7        |             | Lese 13/07/1966 Minstr Transport & Power to SHC                      |                                                  |            |
| HA8        |             | Convey 19/05/1892 The Queens excellent Majesty & Board of Trade to : |                                                  |            |
| HA9        |             | Lese 26/09/1983 Minstr Transport & SHC                               |                                                  |            |
| HA10       |             | Lese 21/11/1986 Minstr Communications to SHC                         |                                                  |            |
| HA11       |             | Convey 21/06/1898 Commissionrs Public Works in Irel to SHC           |                                                  |            |
| HA12       |             | Convey 21/06/1898 Commissionrs Public Works in Irel to SHC           |                                                  |            |
| HA13       |             | Convey 2/12/1823 W Vernon to Commissionrs Improving town of Sligo    | J Gillmor to Comm Of Improving town of Sligo     |            |
| HA15       |             | Convey 7/11/1857 J Lynn to Town & Harbour Commissionrs of Sligo      |                                                  |            |
| HA14       |             | Convey 2/12/1832 J Gillmor to Commissionrs Improving town of Sligo   |                                                  |            |







## APPENDIX B

## SITE SYNOPSIS

**SITE NAME: CUMMEEN STRAND/DRUMCLIFF BAY (SLIGO BAY)**

**SITE CODE: 000627**

This large coastal site extends from Cullamore in the north-west to Killaspug in the south-west, and from Sligo town in the south-east to Drumcliff village in the north-east. It encompasses two large, shallow bays (Drumcliff Bay and Sligo Harbour), Ardboline and Horse Islands, sand dunes and sand hills at Rosses Point, Killaspug, Yellow Strand and Coney Island, grassland at Ballintemple and Ballygilgan (Lissadell) and a variety of other habitats (woodland, salt marsh, sandy beaches, boulder beaches, shingle, fen, freshwater marshes, rocky sea cliffs, lakes). The site is largely underlain by Carboniferous limestone, but acidic rocks are also found on the Rosses Point peninsula. At Serpent Rock in the north-western section of the site the most complete section of the north-western Carboniferous strata is exposed. Here are found an excellent series of fossilised corals which, in some strata, stand out from the rock matrix.

The dominant habitats on the site are estuaries and intertidal sand and mud flats. Sligo Harbour receives the waters of the Garavogue River, which flows from Lough Gill, while Drumcliff Bay receives the Drumcliff River which flows from Glencar Lough. At low tide extensive areas of intertidal flats are exposed in both of these sheltered estuarine bays. The intertidal flats support a diverse macrofauna, with invertebrate species such as lugworm (*Arenicola marina*), cockles (*Cerastoderma edule*), sand mason (*Lanice conchilega*), Baltic tellin (*Macoma balthica*), spire shell (*Hydrobia ulvae*) and mussels (*Mytilus edulis*) being frequent. Of particular note is the presence of eelgrass (*Zostera noltii* and *Z. angustifolia*) beds in both bays. Both estuaries and intertidal flats are of conservation significance and are listed on Annex I of the EU Habitats Directive. Areas of salt marsh fringe both bays in places.

Sand dunes, sand hills and dune grassland are found at Rosses Point, Killaspug, Yellow Strand and Coney Island. The dominant species of the dune grassland behind Yellow Strand are Sand Sedge (*Carex arenaria*) and Meadow-grass (*Poa pratensis*), with associated species including Lady's Bedstraw (*Galium verum*), Mouse-ear Hawkweed (*Hieracium pilosella*), Common Milkwort (*Polygala vulgaris*), Common Dog-violet (*Viola riviniana*), Mountain Everlasting (*Antennaria dioica*), Common Spotted-orchid (*Dactylorhiza fuchsii*), Early Marsh-orchid (*D. incarnata*), Frog Orchid (*Coeloglossum viride*) and Autumn Lady's-tresses (*Spiranthes spiralis*). Embryonic dunes, with characteristic species, including Sand Couch (*Elymus farctus*), occur at the southern end of Rosses Point. Sand dune habitats are rare and threatened in Europe and three types found on the site, embryonic dunes, Marram (*Ammophila arenaria*) dunes and fixed dunes, are listed on Annex I of the E.U. Habitats Directive, the last-named with priority status.

Wetlands on the site include Doonweelin Lake, a freshwater lake on the Rosses Point peninsula, which supports interesting vegetation communities that reflect the

juxtaposition of the underlying acidic and basic rocks. Ardtermon Fen, a small, floristically-rich area of freshwater marsh, swamp, wet grassland and fen is situated at the back of the Yellow Strand sandhills.

The site includes small areas of Hazel (*Corylus avellana*) and Ash (*Fraxinus excelsior*) woodland on limestone (e.g. Cummeen Wood) and several other stands of mixed woodland and wet Willow (*Salix* spp.) woodland (as at Ardtermon Fen).

Cliff-top grassland is common in the north-western part of the site. This is dominated by Red Fescue (*Festuca rubra*) and White Clover (*Trifolium repens*), with associated species including Daisy (*Bellis perennis*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Plantains (*Plantago coronopus*, *P. lanceolata* and *P. maritima*), Bulbous Buttercup (*Ranunculus bulbosus*), Common Scurvygrass (*Cochlearia officinalis*), Field Wood-rush (*Luzula campestris*) and Spring Sedge (*Carex caryophylla*).

The site has a good example of petrifying springs with tufa formations, with several species of bryophyte typical of the *Cratoneurion*. The springs occur along seepage zones in clay sea cliffs on the northern side of Sligo Harbour. Petrifying springs are listed with priority status on Annex I of the EU Habitats Directive.

The site has a very rich and diverse flora, on account of the wide variety of habitats found, and the presence of both basic and acidic substrates. Several rare, Red Data Book species have been recorded from the site, i.e. Rough Poppy (*Papaver hybridum*) which is also listed under the Flora (Protection) Order, 1999, Hoary Whitlowgrass (*Draba incana*) and Yellow Saxifrage (*Saxifraga aizoides*).

Both Drumcliff Bay and Cummeen Strand are important for the large numbers of waterfowl which use them in autumn/winter, including Ringed Plover, Redshank, Lapwing, Knot, Bar-tailed Godwit, Oystercatcher, Curlew, Golden Plover, Dunlin, Turnstone, Brent Goose, Grey Heron, Teal, Wigeon, Mallard, Shelduck and Red-breasted Merganser. The fields at Lissadell and Ballintemple support one of the largest populations of Barnacle Goose in the country (c2000 in winters of 1995/96 and 1996/97). Both Drumcliff Bay and Cummeen Strand have been designated as Special Protection Areas under the EU Birds Directive. The important feeding site for Barnacle Geese at Lissadell is a Statutory Nature Reserve.

The islands in the north-western section of the site hold important seabird colonies. A Cormorant colony of national importance occurs on Ardboline and Horse Islands, with a total of 261 pairs in 1998. Herring Gull and Great Black-backed Gull also breed on both islands. Common Tern formerly bred on both islands. The islands are also used by Barnacle Geese from the adjacent mainland, which roost or seek refuge here. The low sea cliffs on the adjacent mainland at Ballyconnell and Roskeeragh Points also support small numbers of seabirds and both Black Guillemot and Fulmar nest. Choughs feed in the sandy/grassy areas of the site and one pair is known to nest. Several of the bird species that use the site are listed on Annex I of the EU Birds Directive, i.e. Barnacle Goose, Chough, Golden Plover and Bar-tailed Godwit.



Three species listed on Annex II of the EU Habitats Directive are found within this site. Drumcliff Bay, is important for the presence of a large breeding population of Common Seal and Ardboline and Horse Islands on the western side of the site are also important as haul-out areas for this species. The Marsh Fritillary butterfly is found at Rosses Point, while the rare snail, *Vertigo angustior* has recently been recorded from sand dunes at Killaspugbrone.

Cummeen Strand/Drumcliff Bay (Sligo Bay) is an important site of high conservation significance, which includes a wide variety of habitat types, including several listed on Annex I of the EU Habitats Directive, several species listed on Annex II of this directive, large and important populations of waterfowl and seabirds, and several rare plant species.

## SITE SYNOPSIS

**SITE NAME: CUMMEEN STRAND SPA**

**SITE CODE: 004035**

Cummeen Strand is a large shallow bay stretching from Sligo town westwards to Coney Island. It is one of three estuarine bays within Sligo Bay, with Drumcliff Bay to the north and Ballysadare Bay to the south. The Garavogue River flows into the bay and forms a permanent channel.

At low tide, extensive sand and mud flats are exposed. These support a diverse macro-invertebrate fauna which provide the main food supply for the wintering waterfowl. Invertebrate species such as lugworm (*Arenicola marina*), ragworm (*Hediste diversicolor*), cockles (*Cerastoderma edule*), sand mason (*Lanice conchilega*), Baltic tellin (*Macoma balthica*), spire shell (*Hydrobia ulvae*) and mussels (*Mytilus edulis*) are frequent. Of particular note is the presence of eelgrass (*Zostera noltii* and *Z. angustifolia*) beds, which provide a valuable food stock for herbivorous wildfowl. The estuarine and intertidal flat habitats are of conservation significance and are listed on Annex I of the EU Habitats Directive. Areas of salt marsh fringe the bay in places and provide roosting sites for birds during the high tide periods. There are sand dunes at Killaspug Point and Coney Island, with a shingle spit at Standalone Point near Sligo town.

Cummeen Strand is of ornithological importance as it supports important concentrations of wintering waterfowl. The site supports an Internationally Important flock of Brent Geese (peak of 232 individuals in the winter of 1999/00, with the mean of peak monthly counts in the period 1996/99 (except 1998) being 228, peaking at 309) and Nationally Important populations of a further two species – Oystercatcher 891 and Redshank 501 (all figures are average peaks for the period). Other species which occurred in significant numbers included Shelduck 80, Wigeon 178, Teal 70, Mallard 170, Red-breasted Merganser 17, Golden Plover 567, Lapwing 734, Knot 18, Sanderling 18, Dunlin 601, Bar-tailed Godwit 57, Curlew 546, Greenshank 18 and Turnstone 80. Whooper Swans also occurred (9), though they are not regular visitors. The presence of Golden Plover, Bar-tailed Godwit and Whooper Swan is of particular note as these species are listed on Annex I of the EU Birds Directive.

This site is of high ornithological importance, with one species having a population of International Importance and two having populations of National Importance. In addition, there are three species that are listed on Annex I of the Birds Directive. The site is also important as a component of the much larger Sligo Bay complex.

28.02.2002

## APPENDIX C

**Table 1a: Leachate: Source/hazard Scoring Matrix**

| Waste Type                  | Waste Footprint (ha) |                    |           |
|-----------------------------|----------------------|--------------------|-----------|
|                             | ≤ 1 ha               | > 1 ≤ 5 ha         | >5        |
| C&D <sup>1</sup>            | 0.5                  | 1                  | 1.5       |
| Municipal <sup>2</sup>      | 5                    | 7                  | 10        |
| Industrial <sup>3</sup>     | 5                    | 7                  | 10        |
| Pre 1977 sites <sup>4</sup> | 1                    | 2                  | 3         |
|                             |                      | Max                | 10        |
|                             |                      | <b>Result (1a)</b> | <b>10</b> |

**Table 1b: Landfill Gas: Source/hazard Scoring Matrix**

| Waste Type                  | Waste Footprint (ha) |                    |           |
|-----------------------------|----------------------|--------------------|-----------|
|                             | ≤ 1 ha               | > 1 ≤ 5 ha         | >5        |
| C&D <sup>1</sup>            | 0.5                  | 0.75               | 1         |
| Municipal <sup>2</sup>      | 5                    | 7                  | 10        |
| Industrial <sup>3</sup>     | 3                    | 5                  | 7         |
| Pre 1977 sites <sup>4</sup> | 0.5                  | 0.75               | 1         |
|                             |                      | Max                | 10        |
|                             |                      | <b>Result (1b)</b> | <b>10</b> |

**Table 2a: Leachate Migration: Pathways**

| Parameters                                      | Points Available   |
|-------------------------------------------------|--------------------|
| Groundwater Vulnerability<br>(Vertical Pathway) |                    |
| Extreme Vulnerability                           | 3                  |
| High Vulnerability                              | 2                  |
| Moderate Vulnerability                          | 1                  |
| Low Vulnerability                               | 0.5                |
| High – Low Vulnerability                        | 2                  |
|                                                 | Max                |
|                                                 | <b>Result (2a)</b> |

**Table 2b: Leachate Migration: Pathways**

| Parameters                                                                 | Points Available   |
|----------------------------------------------------------------------------|--------------------|
| Groundwater Flow Regime<br>(Horizontal Pathway)                            |                    |
| Karstified Groundwater Bodies (Rk) <sup>5</sup>                            | 5                  |
| Productive Fissured Bedrock Groundwater Bodies<br>(Rf and Lm) <sup>5</sup> | 3                  |
| Gravel Groundwater Bodies (Rg and Lg) <sup>5</sup>                         | 2                  |
| Poorly Productive Bedrock Groundwater Bodies<br>(Li, Pl, Pu) <sup>5</sup>  | 1                  |
|                                                                            | Max                |
|                                                                            | <b>Result (2b)</b> |

<sup>1</sup> Predominantly inert waste with low biodegradable fraction and/or small industrial waste fraction.

<sup>2</sup> Typically non-hazardous domestic waste (highly biodegradable) with potentially small hazardous waste fraction and/or small industrial waste fraction, e.g. town dump.

<sup>3</sup> Generally industrial waste where hazardous waste was known to have been deposited or there is a strong likelihood that hazardous waste was deposited due to the close proximity of such industries.

<sup>4</sup> Pre 1977 wastes would have been substantially degraded within the landfill.

<sup>5</sup> Refer to DEHLG/EPA/GSI 1999, Groundwater Protection Scheme.



**Table 2c: Leachate Migration: Pathways**

| Parameters                                                                                                                | Points Available   |
|---------------------------------------------------------------------------------------------------------------------------|--------------------|
| Surface Water Drainage <sup>6</sup><br>(surface water pathway)                                                            |                    |
| Is there a direct connection between drainage ditches associated with the waste body and adjacent surface water body? Yes | 2                  |
| If no direct connection                                                                                                   | 0                  |
|                                                                                                                           | Max                |
|                                                                                                                           | <b>Result (2c)</b> |

**Table 2d: Landfill Gas: Pathways (assuming receptor within 250m of source)**

| Parameters                                                                   | Points Available   |
|------------------------------------------------------------------------------|--------------------|
| Landfill Gas Lateral Migration Potential                                     |                    |
| Sand and Gravel, Made ground, urban, karst                                   | 3                  |
| Bedrock                                                                      | 2                  |
| All other tills (including limestone, sandstone etc – moderate permeability) | 1.5                |
| All Namurian or Irish Sea Tills (low permeability)                           | 1                  |
| Clay, Alluvium, Peat                                                         | 1                  |
|                                                                              | Max                |
|                                                                              | <b>Result (2d)</b> |

**Table 2e: Landfill Gas: Pathways (assuming receptor located above source)**

| Parameters                                                                   | Points Available   |
|------------------------------------------------------------------------------|--------------------|
| Landfill Gas Vertical (upwards) Potential                                    |                    |
| Sand and Gravel, Made ground, urban, karst                                   | 5                  |
| Bedrock                                                                      | 3                  |
| All other tills (including limestone, sandstone etc – moderate permeability) | 2                  |
| All Namurian or Irish Sea Tills (low permeability)                           | 1                  |
| Clay, Alluvium, Peat                                                         | 1                  |
|                                                                              | Max                |
|                                                                              | <b>Result (2e)</b> |

**Table 3a: Leachate Migration: Receptors**

| Parameters                                                             | Points Available   |
|------------------------------------------------------------------------|--------------------|
| Human Presence (presence of a house indicates potential private wells) |                    |
| On or within 50m of the waste body                                     | 3                  |
| Greater than 50m but less than 250m of the waste body                  | 2                  |
| Greater than 250m but less than 1km of the waste body                  | 1                  |
| Greater than 1km of the waste body                                     | 0                  |
|                                                                        | Max                |
|                                                                        | <b>Result (3a)</b> |

<sup>6</sup> This element needs to be determined during the site inspection (including walkover survey). The presence of a direct link between surface water drainage from the waste body and any adjacent surface water body implies the existence of a pathway.

**Table 3b: Leachate Migration: Receptors**

| Parameters                                                                            | Points Available   |
|---------------------------------------------------------------------------------------|--------------------|
| <b>Protected Areas (SWDTE or GWDTE)</b>                                               |                    |
| Within 50m of the waste body                                                          | 3                  |
| Greater than 50m but less than 250m of the waste body                                 | 2                  |
| Greater than 250m but less than 1km of the waste body                                 | 1                  |
| Greater than 1km of the waste body                                                    | 0                  |
| Undesignated sites <sup>7</sup> within 50m of site of the waste body                  | 1                  |
| Undesignated sites <sup>7</sup> greater than 50m but less than 250m of the waste body | 0.5                |
| Undesignated sites <sup>7</sup> greater than 250m of the waste body                   | 0                  |
|                                                                                       | <i>Max</i>         |
|                                                                                       | <b>Result (3b)</b> |

**Table 3c: Leachate Migration: Receptors**

| Parameters                                               | Points Available   |
|----------------------------------------------------------|--------------------|
| <b>Aquifer Category<sup>8</sup> (resource potential)</b> |                    |
| Regionally Important Aquifers (Rf, Rk, Rg)               | 5                  |
| Locally Important Aquifers (Li, Lm, Rg)                  | 3                  |
| Poor Aquifers (Pi, Pu)                                   | 1                  |
|                                                          | <i>Max</i>         |
|                                                          | <b>Result (3c)</b> |

- Rk Regionally Important Karstified Aquifers  
Rf Regionally Important Fissured Bedrock Aquifers  
Rg Regionally Important Extensive Sand/Gravel Aquifers  
Li Locally Important Sand/Gravel Aquifers  
Lm Locally Important Bedrock Aquifers – Generally Moderately productive  
Lg Locally Important Bedrock Aquifers – Generally productive only in local zones  
Pi Poor Bedrock Aquifers - Generally unproductive except in local zones  
Pu Poor Bedrock Aquifers - Generally unproductive

**Table 3d: Leachate Migration: Receptors**

|                                                                               |                    |
|-------------------------------------------------------------------------------|--------------------|
| <b>Public Water Supplies (other than private wells)</b>                       |                    |
| Within 100m of site boundary                                                  | 7                  |
| Greater than 100m but less than 300m or within Inner SPA (SI) for GW supplies | 5                  |
| Greater than 300m but less than 1km or within Outer SPA (SO) for GW supplies  | 3                  |
| Greater than 1km (karst aquifer)                                              | 3                  |
| Greater than 1km (no karst aquifer)                                           | 0                  |
|                                                                               | <i>Max</i>         |
|                                                                               | <b>Result (3d)</b> |

<sup>7</sup> The term “Undesignated sites” refers to wetland sites that are not designated under the Habitats or Bird Directive or Wildlife Act but are considered on a local scale. Consultation with NPWS is required to identify such sites.

<sup>8</sup> (DOH/LG/EPA/GSI 1999) Groundwater Protection Scheme

**Table 3e: Leachate Migration: Receptors**

| Parameters                          | Points Available   |
|-------------------------------------|--------------------|
| Surface Water Bodies                |                    |
| Within 50m of site boundary         | 3                  |
| Greater than 50m but less than 250m | 2                  |
| Greater than 250m but less than 1km | 1                  |
| Greater than 1km                    | 0                  |
|                                     | <i>Max</i>         |
|                                     | <b>Result (3e)</b> |

**Table 3f: Leachate Gas: Receptors**

| Parameters                             | Points Available   |
|----------------------------------------|--------------------|
| Human Presence                         |                    |
| On site or within 50m of site boundary | 5                  |
| Greater than 50m but less than 150m    | 3                  |
| Greater than 150m but less than 250m   | 1                  |
| Greater than 250m                      | 0.5                |
|                                        | <i>Max</i>         |
|                                        | <b>Result (3f)</b> |

## APPENDIX D



**AGL08349\_03**



**REPORT  
ON THE  
GEOPHYSICAL SURVEY  
AT  
FINISKLIN, SLIGO  
FOR  
MALONE O'REGAN**

**12<sup>th</sup> October 2010**

## ***PRIVATE AND CONFIDENTIAL***

THE FINDINGS OF THIS REPORT ARE THE RESULT OF A GEOPHYSICAL SURVEY USING NON-INVASIVE SURVEY TECHNIQUES CARRIED OUT AT THE GROUND SURFACE. INTERPRETATIONS CONTAINED IN THIS REPORT ARE DERIVED FROM A KNOWLEDGE OF THE GROUND CONDITIONS, THE GEOPHYSICAL RESPONSES OF GROUND MATERIALS AND THE EXPERIENCE OF THE AUTHOR. APEX GEOSERVICES LTD. HAS PREPARED THIS REPORT IN LINE WITH BEST CURRENT PRACTICE AND WITH ALL REASONABLE SKILL, CARE AND DILIGENCE IN CONSIDERATION OF THE LIMITS IMPOSED BY THE SURVEY TECHNIQUES USED AND THE RESOURCES DEVOTED TO IT BY AGREEMENT WITH THE CLIENT. THE INTERPRETATIVE BASIS OF THE CONCLUSIONS CONTAINED IN THIS REPORT SHOULD BE TAKEN INTO ACCOUNT IN ANY FUTURE USE OF THIS REPORT.

| PROJECT NUMBER                                         | AGL08349 |               |                               |
|--------------------------------------------------------|----------|---------------|-------------------------------|
| AUTHOR                                                 | CHECKED  | REPORT STATUS | DATE                          |
| EURGEOL YVONNE O'CONNELL<br>P.GEO., M.Sc. (GEOPHYSICS) |          | V.1 DRAFT     | 22 <sup>ND</sup> MAY 2009     |
| EURGEOL YVONNE O'CONNELL<br>P.GEO., M.Sc. (GEOPHYSICS) |          | V.2 DRAFT     | 25 <sup>TH</sup> MAY 2009     |
| EURGEOL YVONNE O'CONNELL<br>P.GEO., M.Sc. (GEOPHYSICS) |          | V.3 FINAL     | 12 <sup>TH</sup> OCTOBER 2010 |

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**DRAWINGS**

|                 |                                                                                                                                        |
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| Drawing 8349_02 | Figure 5: Interpreted Resistivity & Seismic Profiles                                                                                   |

**APPENDICES**

|             |                         |
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| Appendix I  | Geophysical Methodology |
| Appendix II | Shear Wave Data         |

## 1. SUMMARY

- APEX Geoservices Ltd. was requested by Malone O'Regan to carry out a geophysical survey on a landfill site at Finisklin, Sligo. The majority of the site comprises land reclaimed from the estuary by backfilling waste materials comprising municipal, commercial and industrial waste on top of the estuary mudflats.
- The purpose of the survey was to assess the sub-surface conditions including thickness and extent of the buried waste and to identify possible leachate.
- The geophysical survey comprised EM31 ground conductivity mapping, magnetic profiling, 2D resistivity profiling, seismic refraction profiling and MASW shear wave profiling.
- The combined geophysical data have been interpreted as indicating soft to firm or loose to medium dense fill material comprising sandy silt/clay mixed with C&D Waste and organic waste overlying estuarine sands and silts over saturated sands and gravels and moderately weathered shale bedrock.
- The geophysical data indicates that the thickness of the fill material ranges from 0.6m to possibly up to 10m.
- Localized increases in resistivity values within the fill material indicate localised increases in the C&D content and a decrease in the organic waste content of the fill. The profiles suggest that the highest concentration of C&D waste is in the east of the site.
- Some very high conductivity values in the northwest and southeast of the site have been interpreted as indicating the presence of very conductive/possibly metallic material spread across the surface of the site.
- Three localized zones in the centre of the site have been highlighted as zones of predominantly organic waste material.
- The variations in the composition of the fill material coupled with the effects of the underlying high conductivity estuarine sands and silts and the very highly conductive/possibly metallic material spread across the northwest and southeast of the site, does not allow the accurate mapping of variations in fill thickness across the site.
- The presence of leachate underlying the fill material cannot be determined as in this environment the leachate is likely to have similar low resistivity values to the estuarine sands and silts.
- Follow-up direct investigation is recommended to confirm the findings of the geophysical report.
- In addition, a greater density of 2D resistivity profiles could be carried out across the site to provide more information on variations in the type and thickness of fill material across the site.
- The geophysical data should be reviewed on completion of any further direct investigation.



## 2. INTRODUCTION

APEX Geoservices Ltd. was requested by Malone O'Regan to carry out a geophysical survey on a landfill site at Finisklin, Sligo. An environmental risk assessment of the landfill site is being carried out. In accordance with "The code of Practice for the Environmental Risk Assessment of Unregulated Waste Disposal Sites", geophysical survey was requested as part of the site investigation.

### 2.1 Survey Objectives

The objectives of the geophysical survey are:

- Assess the sub-surface conditions including thickness and extent of the buried waste,
- Identify possible leachate,

### 2.2 Site Background

The Finisklin landfill site covers an area of approximately 12 (Ha). It is located on the southern shores of the Garavogue River Estuary on the western edge of Sligo Town. The majority of the site comprises land reclaimed from the estuary by backfilling waste materials on top of the estuary mudflats. The waste material composition is mixed and comprises municipal, commercial and industrial waste. Large quantities of C & D waste are expected in many parts of the site and particularly along Deep Water Berths Road.

The survey is bounded to the south by the Finisklin Road, to the west by the estuary, to the north by industrial units mainly located along Deep Water Berths Road and to the east by other industrial units. The northwest part of the site parallel to the shore is a designated Special Protection Area (SPA).

The topography across the site at the time of surveying ranged from 6.5mOD in the northwest sloping to approx. 4mOD in the east and 2.5mOD along the boundary with the road west of the site. An access road runs through the survey area. The road is bounded by concrete and wire fencing. Some scrap metal and objects were noted on the surface and protruding from the fill material in places across the site. Parts of the site along the southern and western boundary could not be surveyed as they were heavily overgrown.



The geological map for the area (Geological Survey of Ireland) indicates that the survey area is underlain by the Glencar Formation comprising fine limestone and calcareous shale.

### 2.3 Survey Rationale

The geophysical survey proposed to assess the sub-surface conditions across the site included EM31 ground conductivity surveying at nominal 10 m line separations. The recorded data provides information on variations in the bulk conductivity value which reflects variation in the composition of the material in the top 6m of the subsurface.

On review of the conductivity data, a magnetic survey was carried out at selected locations indicating very high conductivities in order to confirm the presence/absence of buried metal waste.

Also on review of the conductivity data and to acquire a good spatial distribution across the site, eight 2D resistivity profiles were carried out in order to provide information on the thickness of the waste material and to try to identify any possible areas leachate.

The 2D resistivity survey was followed by seismic refraction profiling to provide information on the stiffness of the waste material and, combined with the resistivity data, provide information on the different strata underlying the site. In addition, MASW processing was carried out to provide further information on the stiffness of the different layers and to provide Gmax and Shear wave velocity (Vs) profiles of the subsurface material.

### 3. INTERPRETED RESULTS

The integrated geophysical results from each of the methods used are summarized on Drawing 8349\_01, Figure 4 and on the interpreted sections included on Drawing 8349\_02, Figure 5.

#### 3.1 EM31 Conductivity

The EM31 conductivity survey locations are shown on Drawing 8349\_01, Figure 1. The recorded EM31 conductivity values are contoured on Drawing 8349\_01, Figure 2. The conductivity values ranged from 0-130 milliSiemens/metre (mS/m). The majority of the values (97%) were in the range 28 to 84 mS/m with 54% in the range 28 to 50 mS/m.

The presence of metallic objects and interference from cultural noise such as fences, pipes, tanks, buildings, etc. produce both very high and very low conductivity values. In addition, during the survey an inphase component value was acquired simultaneously with the EM31 conductivity data. Variations in this component are indicative of the presence of metallic objects. The EM31 inphase values are contoured on Drawing 8349\_01, Figure 3.

The EM31 conductivity values have been broadly interpreted on the following basis:

| Conductivity (mS/m) | Interpretation of 0-6m Below Ground Level                                       |
|---------------------|---------------------------------------------------------------------------------|
| 50 - 130            | Organic Waste Material                                                          |
|                     | Conductive/metallic material on surface of the site                             |
|                     | Interference related to Metallic Objects                                        |
| 38 - 50             | Fill comprising sandy Silt/Clay mixed with C&D Waste and Organic Waste Material |
| 28 – 38             | Fill with increased C&D Waste content                                           |
| 0 - 28              | Interference related to Metallic Objects                                        |

The EM31 inphase values ranged from 200-1000 milliSiemens/metre (mS/m) with a background value of 770 to 850 units. The inphase values have been broadly interpreted on the following basis:

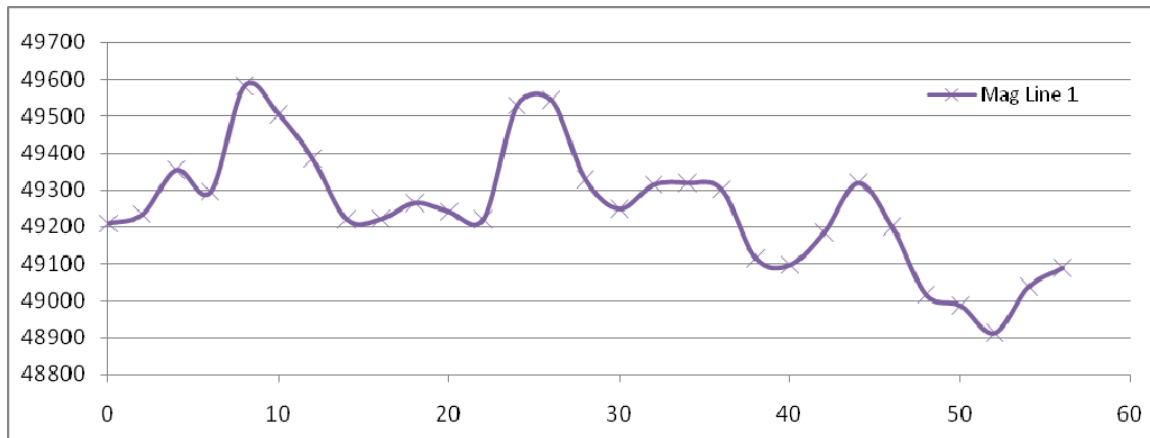
| In-Phase (ppm) | Interpretation of 0-6m Below Ground Level   |
|----------------|---------------------------------------------|
| 200 - 770      | Areas indicative of surface or buried metal |
| 770 – 850      | Background Values                           |
| 850 - 1000     | Areas indicative of possible buried metal   |

#### 3.2 Total Field Magnetic Surveying

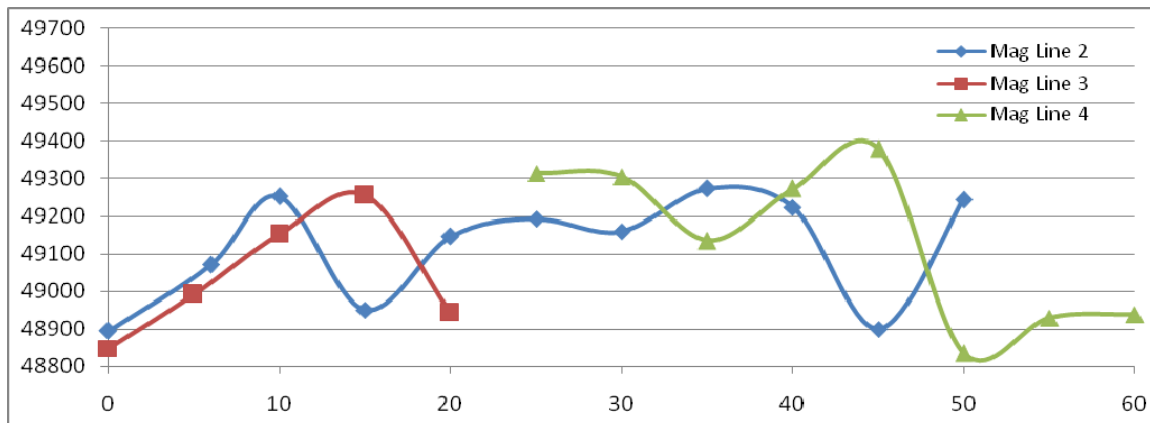
Total Field Magnetic profiles were recorded at two selected locations of very high conductivity and inphase values at the site; in the northwest (Mag Line 1) and in the east (Mag Lines 2 to 4) (Drawing 8349\_01, Figure 1).

In the northwest (Mag Line 1) the recorded values ranged from 48913 – 49583 nanoTesla (nT) with an average background value of 49050nT. The recorded data showed large variations from the

background value in this area (up to 533nT) suggesting the presence of metallic objects in the underlying material. In the absence of metallic objects, variations would be of the order of 10's of nanoTeslas.



In the east (Mag Lines 2 to 4) the recorded values ranged from 48370 – 49380 nT with an average background value of 49250nT. This data also indicates that there are large variations from the background value in this area (up to 880nT) suggesting the presence of metallic objects in the underlying material.



### 3.3 2D Resistivity Profiling

Eight resistivity profiles were recorded across the site at locations selected based on review of the conductivity data and to acquire a good spatial distribution across the site. The locations are indicated on Drawing 8349\_01, Figure 1. The interpreted sections are included on Drawing 8349\_02, Figure 5.

The resistivity data were interpreted on the following basis:

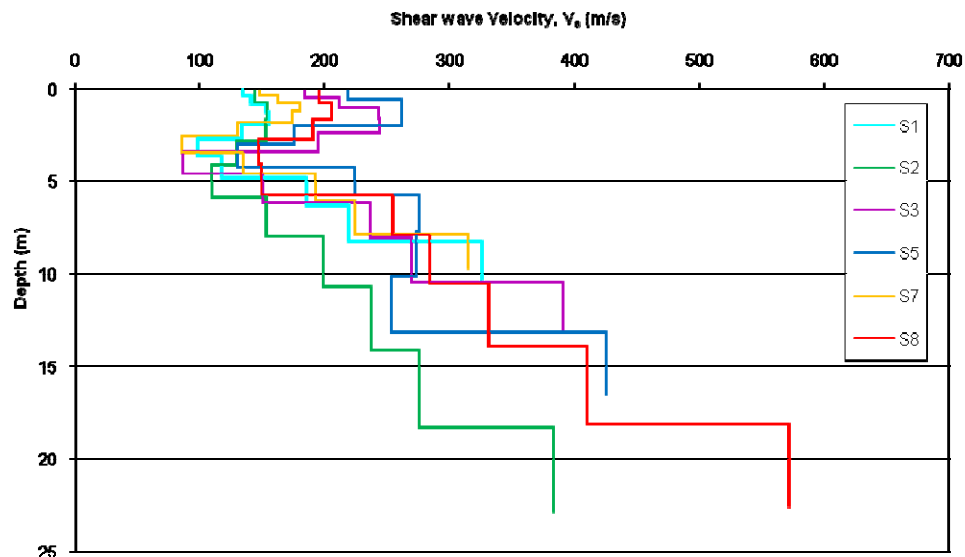
| Apparent Resistivity (ohm-m) | Interpretation                                                                  |
|------------------------------|---------------------------------------------------------------------------------|
| 5 - 30                       | Organic Waste Material                                                          |
| 30 – 100                     | Fill comprising sandy Silt/Clay mixed with C&D Waste and Organic Waste Material |
| 100 - 250                    | Fill comprising sandy Silt/Clay mixed with C&D Waste                            |
| 250 - 500                    | Fill comprising predominantly C&D Waste                                         |
| 5 - 30                       | Saturated Estuarine Silts and Sands                                             |
| 30 – 100                     | Saturated Sand and Gravels or Possible Highly Weathered Shale                   |
| 250 - 750                    | Possible Moderately Weathered Shale                                             |

### 3.4 Seismic Refraction Profiling

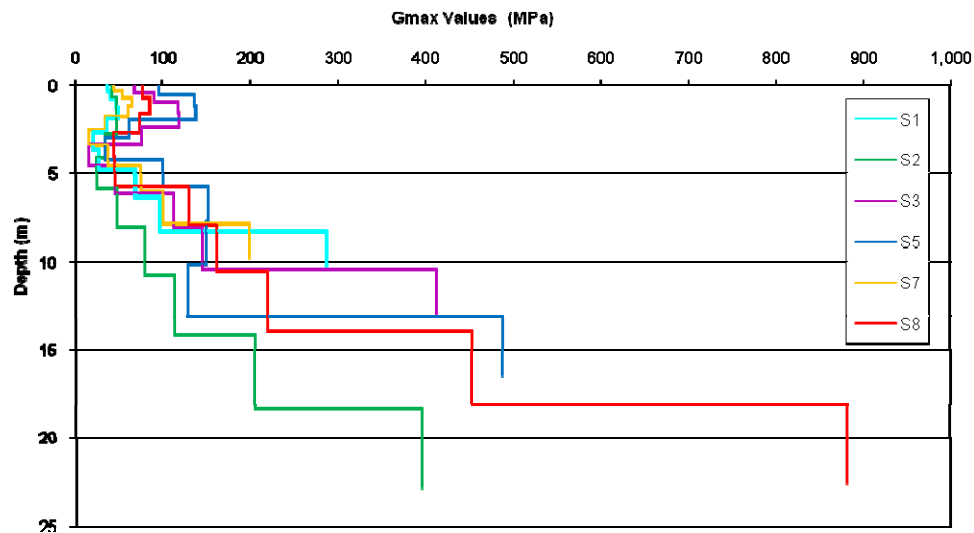
Six seismic refraction profiles were recorded on the 2D resistivity profiles. The locations are indicated on Drawing 8349\_01, Figure 1. The seismic data indicated up to 3 subsurface p-wave velocity layers which have been interpreted on the following basis:

| P-wave Velocity Vp (m/s) | Average Vp (m/s) | Interpretation                           |
|--------------------------|------------------|------------------------------------------|
| 211-508                  | 330              | Fill overlying Estuarine Silts and Sands |
| 314-739                  | 524              |                                          |
| 1042-1976                | 1588             | Possible Moderately Weathered Rock       |

The Shear wave velocity profile (Vs) of each of the seismic profiles was determined by multichannel analysis of the surface wave (MASW). The measured shear wave velocities range from 98 to 572 m/s and the derived  $G_{\max}$  values range from 19 to 882 MPa.







The plots of  $V_s$  and  $G_{max}$  show similar trends with values initially increasing from surface to depths of approx. 2m bgl followed by a decrease in values to depths of 4m to 6m bgl followed by increasing values to depths of 20m bgl. The range of shear wave velocities ( $V_s$ ) agrees with the P-wave seismic velocities ( $V_p$ ) and suggests soft material in the top 6m becoming stiffer with depth. The  $V_s$  and  $G_{max}$  data and plots are contained in Appendix II.

*Note: A soil/fill density of  $2000 \text{ kg/m}^3$  and a rock density of  $2700 \text{ kg/m}^3$  has been used in the calculations for  $G_{max}$ .*

### 3.5 Integrated Interpretation

The geophysical interpretation is summarized on Drawing 8349\_01, Figure 4.

The conductivity survey recorded relatively high values (28-50mS/m) across the entire site. In conjunction with the 2D resistivity profiles these high values were interpreted as indicating the presence of fill comprising sandy silt/clay mixed with C&D Waste and organic waste. At the lower end of this range the conductivities have been interpreted in conjunction with the 2D resistivity profiles as indicating a slight increase in the C&D Waste content of the fill material.

Some very high conductivity values (50-130 mS/m) were recorded in the northwest and southeast of the site. These areas also have high inphase values. These very high conductivity values would suggest the presence of very low resistivity material in the upper 6m. However Profiles R2, R4 and R8 recorded across these areas do not indicate the presence of material with significantly lower resistivities than on R3, R5 and R6. The very high conductivity values have therefore been interpreted as indicating the presence of very conductive/possibly metallic material spread across the surface of the site in these areas. Magnetic profiles were recorded across these areas and large variations in the magnetic values suggest that the underlying material has a metallic signature.

Three zones of very high conductivity values (50-75 mS/m) interpreted in conjunction with the inphase data (which did not indicate the presence of metal objects) and 2D resistivity profile R1 (which indicated very low resistivity material from the surface, have been highlighted as zones of predominantly organic waste material on Drawing 8349\_01, Figure 4.

Some additional interference from metal fences, gates and surface metal objects has been highlighted as cultural noise on Drawing 8349\_01, Figure 4.

The combined 2D resistivity, Vp and Vs seismic data have been interpreted as follows:

| Layer | Resistivity (ohm-m) | P-wave Velocity Vp (m/s) | S-wave Velocity Vs (m/s) | Interpretation                                                                  | Stiffness                             |
|-------|---------------------|--------------------------|--------------------------|---------------------------------------------------------------------------------|---------------------------------------|
| 1     | 5 - 30              | 211-739                  | 100-330                  | Organic Waste Material                                                          | Soft to Firm or Loose to Medium Dense |
| 2     | 30 – 100            |                          |                          | Fill comprising sandy Silt/Clay mixed with C&D Waste and Organic Waste Material |                                       |
| 3     | 100 - 250           |                          |                          | Fill comprising sandy Silt/Clay mixed with C&D Waste                            |                                       |
| 4     | 250 - 500           |                          |                          | Fill comprising predominantly C&D Waste                                         |                                       |
| 5     | 5 - 30              |                          |                          | Saturated Estuarine Silts and Sands                                             |                                       |
| 6     | 30 – 100            | 1042-1976                | 330-570                  | Probable Saturated Sand and Gravels                                             |                                       |
| 7     | 250 - 750           |                          |                          | Probable Moderately Weathered Shale                                             |                                       |

The combined data have been interpreted as indicating soft to firm or loose to medium dense fill material comprising sandy silt/clay mixed with C&D Waste and organic waste overlying estuarine sands and silts over weathered shale bedrock.

On the recorded profiles, the thickness of the fill material ranges from 0.6m on Profile R7 to possibly up to 10m on R2. Localized increases in resistivity values within the fill material indicate an increase in the C&D content and a decrease in the organic waste content of the fill. The profiles suggest that the highest concentration of C&D waste is in the east in the vicinity of R7 and R8.

Underlying the estuarine sands and silts the Vp seismic velocities, in conjunction with increased resistivity values, would be indicative of saturated sands and gravels. The same values could also be indicative of highly weathered shale bedrock. The Vs data from the MASW survey suggests low shear strength through this material suggesting that it comprises sands and gravels and not highly weathered shale.

The variations in the composition of the fill material coupled with the effects of the underlying high conductivity estuarine sands and silts and the very highly conductive/possibly metallic material spread across the northwest and southeast of the site, does not allow the accurate mapping of variations in fill thickness across the site.

The presence of leachate underlying the fill material cannot be determined as in this environment the leachate is likely to have similar low resistivity values to the estuarine sands and silts.

#### 4. RECOMMENDATIONS

Follow-up direct investigation is recommended to confirm the findings of the geophysical report.

In addition, a greater density of 2D resistivity profiles could be carried out across the site to provide more information on variations in the type and thickness of fill material across the site.

The geophysical data should be reviewed on completion of any further direct investigation.

## 5. REFERENCES

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## **APPENDIX I      GEOPHYSICAL METHODOLOGY**

### **M1.            EM31 Conductivity Mapping**

This method operates on the principle of inducing currents in conductive substrata and measuring the resultant secondary electro-magnetic field. The strength of this secondary EM field is calibrated to give apparent ground conductivity in milliSiemens/metre (mS/m). As the effective penetration of this method is around 6m below ground level the measured conductivity is a function of the different overburden layers and/or rock from 0 to 6m below ground level.

The equipment used was a GF EM31 Conductivity meter equipped with data logger. This instrument features a real time graphic display of the previous 20 measurement points to monitor data quality and results. 5798 conductivity readings were recorded on the 5<sup>th</sup> and 6<sup>th</sup> May 2009.

Conductivity and in-phase values were recorded on an approximate 2.5m x 10m grid. Local conditions and variations were recorded.

The data were downloaded and plotted. Data which was contaminated by metallic objects was removed. Assignment of material types and possible anomaly sources was carried out, with cross-reference to other data. A scaled plot of conductivity against distance was prepared (Drawing 8349\_01, Figure 2). The contoured inphase results are also shown (Drawing 8349\_01, Figure 3).

### **M2.            Magnetic Profiling**

Magnetic profiling is carried out with a proton precession magnetometer which operates on the principle of the realignment of protons in a hydrocarbon fluid. Following the application of a current through a coil surrounding the hydrocarbon fluid, the protons realign in the direction of the external field (the earth's magnetic field) measured in NanoTeslas (nT). Large deviations in the recorded magnetic field would indicate the presence of metallic objects.

Magnetic profiling was carried out using a Geometrics G856 proton precession magnetometer. The survey was carried out on the 7<sup>th</sup> May 2009.

Readings were recorded at 2m and 5m station intervals at selected locations across the survey area. Local conditions and variations were recorded. A base station was repeated throughout the survey.

Drift corrections were applied to the data profiles of the total magnetic field in nanoTeslas (nT) against distance were prepared and are included in the text of the report.

### **M3.            2D Resistivity Profiling**

2D Resistivity profiling makes use of the Wenner resistivity array. The 2D-resistivity profiling method records a large number of resistivity readings in order to map lateral and vertical changes in material types. The 2D-resistivity profiling method involves the use of 32 electrodes connected to a resistivity meter, using computer software to control the process of data collection and storage

Eight spreads were recorded on the 5<sup>th</sup> and 6<sup>th</sup> May 2009. The profiles were recorded using a Tigre resistivity meter, imaging software, two 32 takeout multicore cables and up to 32 stainless steel electrodes. The recorded data was processed and viewed immediately after the survey.



## **APPENDIX I      GEOPHYSICAL METHODOLOGY**

2D-Resistivity profiles R1 and R3 to R8 were 93m in length with a depth of penetration of approximately 16m. 2D-Resistivity profile R2 was 155m in length with a depth of penetration of approximately 30m.

The field readings were stored in computer files and inverted using the RES2DINV package (Campus Geophysical Instruments, 1997) with up to 5 iterations of the measured data carried out for each profile to obtain a 2D-Depth model of the resistivities.

The inverted 2D-Resistivity models and corresponding interpreted geology are displayed as Profiles R1- R8 on Drawing 8349\_02, Figure 5. The distance is indicated along the horizontal axis of the profile. All profiles have been contoured using the same contour intervals and colour codes.

### **M4.              Seismic Profiling**

Seismic profiling measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

In the MASW method Surface waves (Rayleigh waves) are utilized to determine the elastic properties of the shallow subsurface (<15m). Surface waves carry up to two-thirds of the seismic energy but are usually considered as noise in conventional body wave reflection and refraction seismic surveys.

The penetration depth of surface waves changes with wavelength, i.e. longer wavelengths penetrate deeper. When the elastic properties of near surface materials vary with depth, surface waves then become dispersive, i.e. propagation velocity changes with frequency. The propagation (or phase) velocity, is determined by the average elastic property of the medium within the penetration depth. Therefore the dispersive nature of surface waves may be used to investigate changes in elastic properties of the shallow subsurface.

The Multi-channel Analysis of Surface Waves (MASW) was used for this survey (Park et al., 1998, 1999). This method employs the multi-channel recording and processing techniques (Sheriff and Geldart, 1982) that have similarities to those used in a seismic reflection survey and which allow better waveform analysis and noise elimination. To produce a stiffness profile of the subsurface using Surface waves the following basic procedure is followed:

- (i)      A point source (eg. a sledgehammer) is used to generate vertical ground motions,
- (ii)     The ground motions are measured using low frequency geophones, which are disposed along a straight line directed toward the source,
- (iii)    the ground motions are recorded using either a conventional seismograph, oscilloscope or spectrum analyzer,
- (iv)    a dispersion curve is produced from a spectral analysis of the data showing the variation of Surface wave velocity with wavelength,
- (v)    the dispersion curve is inverted using a modeling and least squares minimization process to produce a subsurface profile of the variation of Surface wave and shear wave velocity with depth,
- (vi)    a stiffness-depth profile (shear modulus, G) can be derived from elastic theory.

A Geode high resolution 24 channel digital seismograph, 24 10HZ vertical geophones and a 10 kg hammer and buffalo gun source were used to provide first break information, with two 12 take-out

## **APPENDIX I      GEOPHYSICAL METHODOLOGY**

cables (5m spacing) and a trigger geophone. Equipment was carried in a 4WD vehicle with a two-person crew.

Six spreads were recorded on the 7<sup>th</sup> May 2009. Each seismic spread consisted of 24 collinear geophones at spacings of 3m or 5m, and were 69m or 115m in length. Records from up to seven different positions were taken on each spread (2 x off-end, 2 x end, 3 x middle) to ensure optimum coverage of all refractors.

First break picking in digital format was carried out using the FIRSTPIX software program to construct p-wave ( $V_p$ ) traveltime plots for each spread. Velocity phases were selected from these plots using the GREMIX software program and were used to calculate the thickness of individual velocity units. Topographic data were input. Material types were assigned and estimation made of material properties, cross-referenced to the 2D Resistivity data. The processed seismic data are displayed in on the relevant 2D resistivity profiles on Drawing 8349\_02, Figure 5.

Approximate errors for  $V_p$  velocities are estimated to be +/- 10%. Errors for the calculated layer thicknesses are of the order of +/-20%. Possible errors due to the "hidden layer" and "velocity inversion" effects may also occur (Soske, 1959).

MASW processing was carried out using the SURFSEIS processing package developed by Kansas Geological Survey (KGS, 2000). SURFSEIS is designed to generate a shear wave ( $V_s$ ) velocity profile. The processed profiles are overlaid on the relevant seismic profiles on Drawing 8349\_02, Figure 5. SURFSEIS data processing involves three steps:

- (i) Preparation of the acquired multichannel record. This involves converting the data file into the processing format.
- (ii) Production of a dispersion curve from a spectral analysis of the data showing the variation of Raleigh wave phase velocity with wavelength. Confidence in the dispersion curve can be estimated through a measure of signal to noise ratio (S/N) which is obtained from a coherency analysis. Noise includes both body waves and higher mode surface waves. To obtain an accurate dispersion curve the spectral content and phase velocity characteristics are examined through an overtone analysis of the data.
- (iii) Inversion of the dispersion curve is then carried out to produce a subsurface profile of the variation of shear wave velocity with depth.

The shear wave velocities were then converted into shear modulus values using the formula:

$$(1) \quad G = V_s^2 \cdot \rho / 1000000$$

|       |        |   |                             |
|-------|--------|---|-----------------------------|
| Where | G      | = | Shear Modulus (MPa)         |
|       | $V_s$  | = | Shear Wave Velocity (m/s)   |
|       | $\rho$ | = | Density ( $\text{kg/m}^3$ ) |

For the purpose of the calculation in this report a soil density of  $2000 \text{ kg/m}^3$  has been assumed.

## **APPENDIX II      SURFACE WAVE DATA**



FIGURE 1: GEOPHYSICAL SURVEY LOCATIONS  
Scale 1:2000

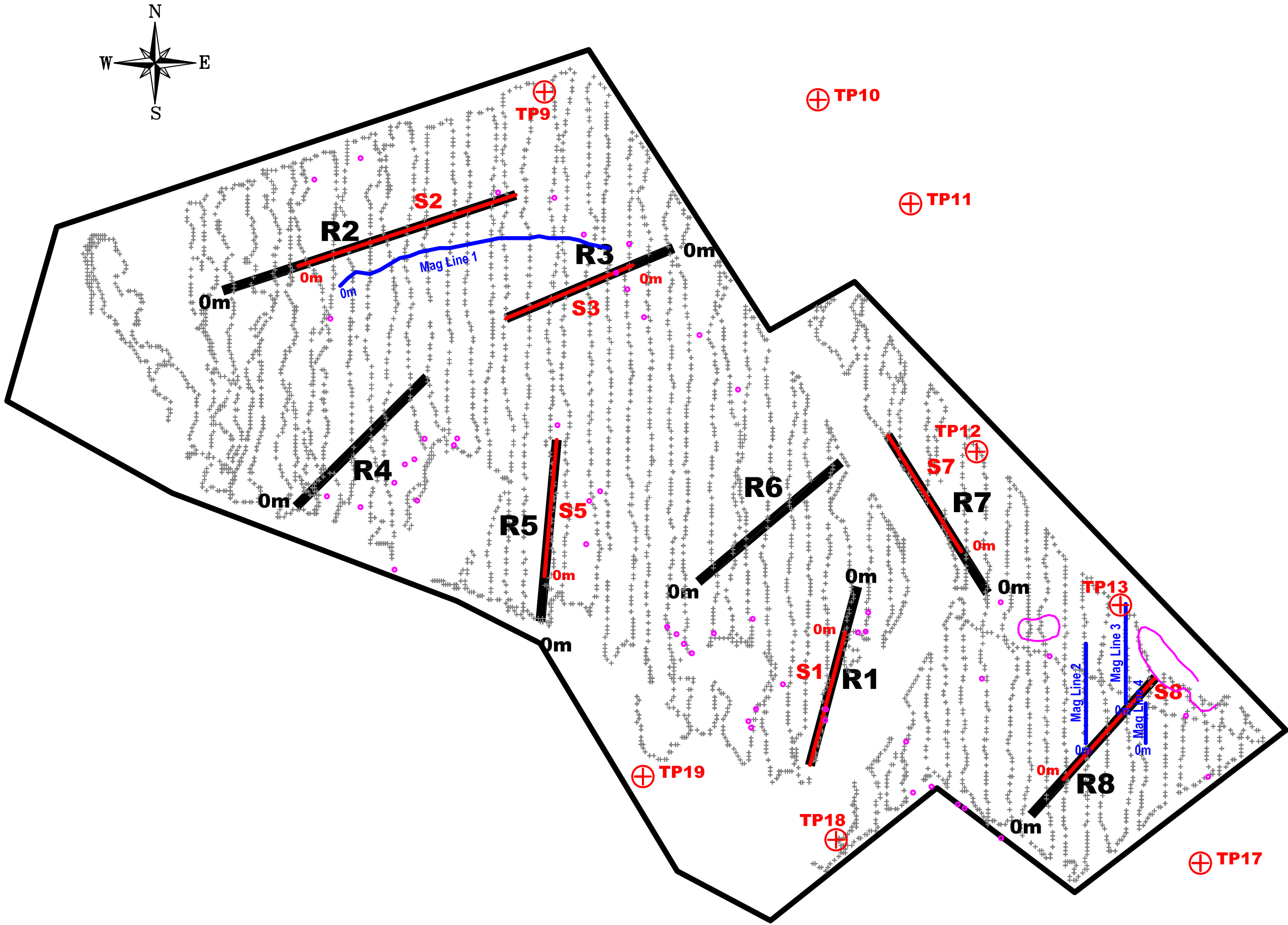


FIGURE 3: INPHASE VALUES  
Scale 1:2000

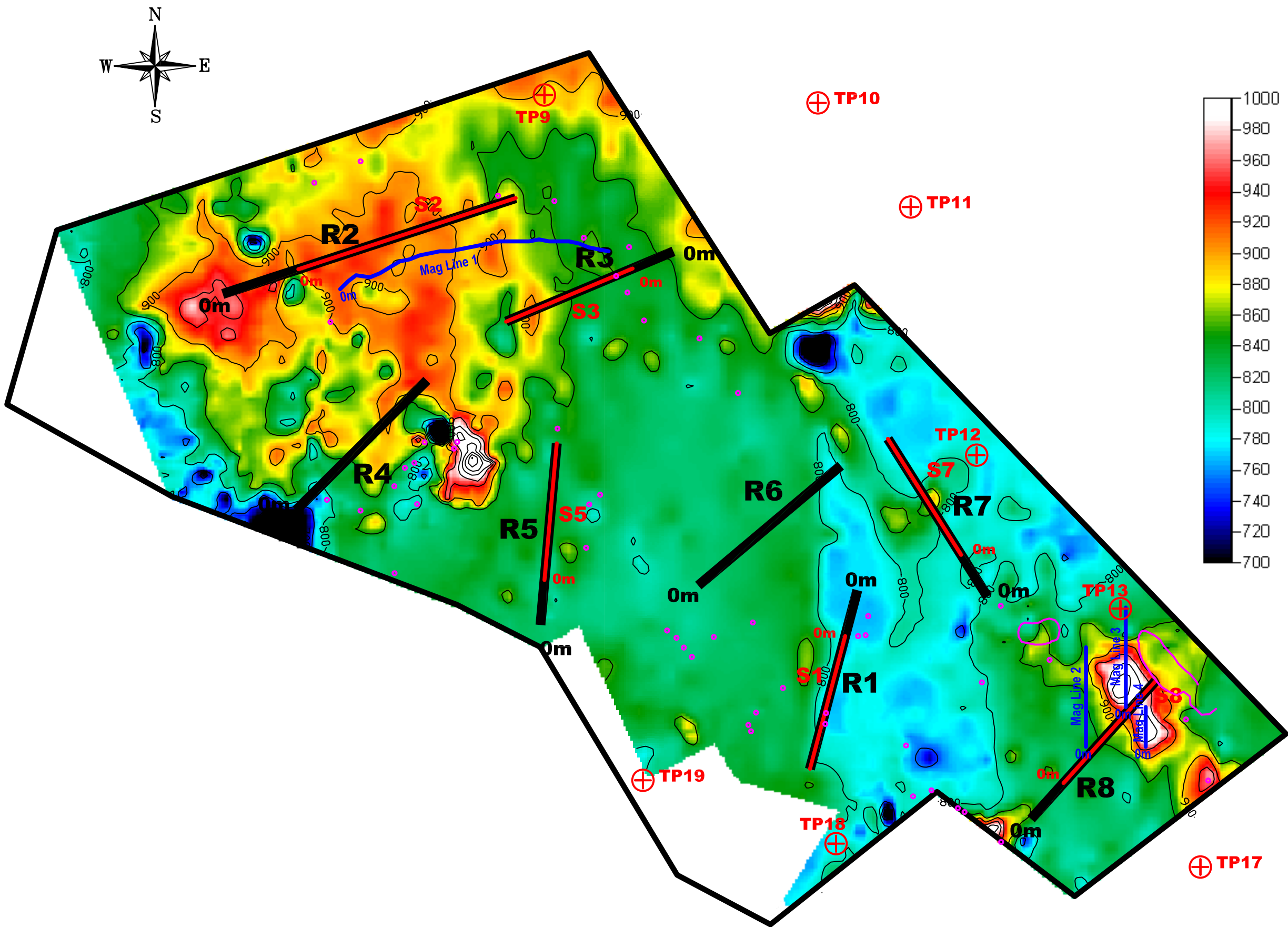


FIGURE 2: EM31 CONDUCTIVITY CONTOURS (mS/m)  
Scale 1:2000

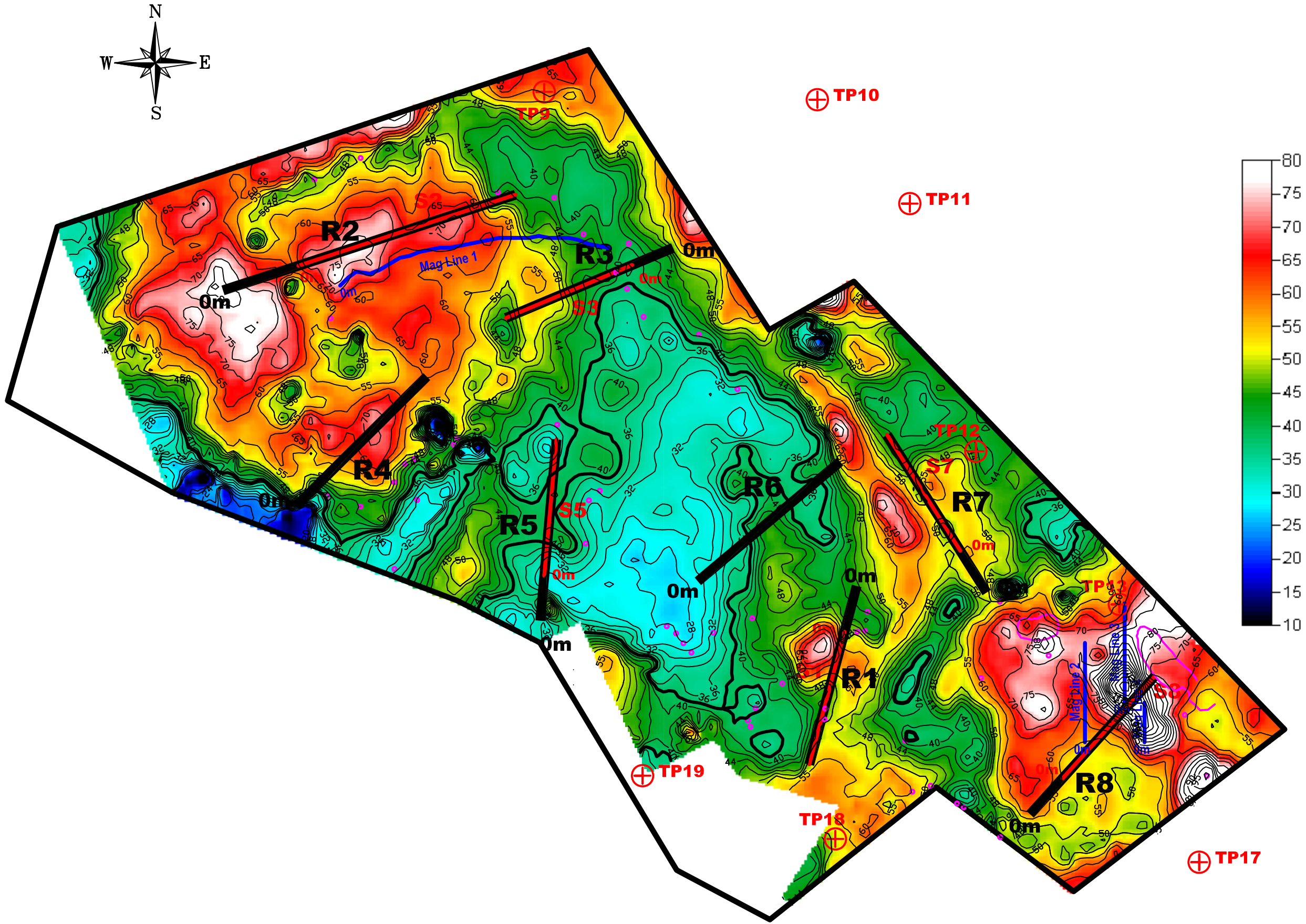
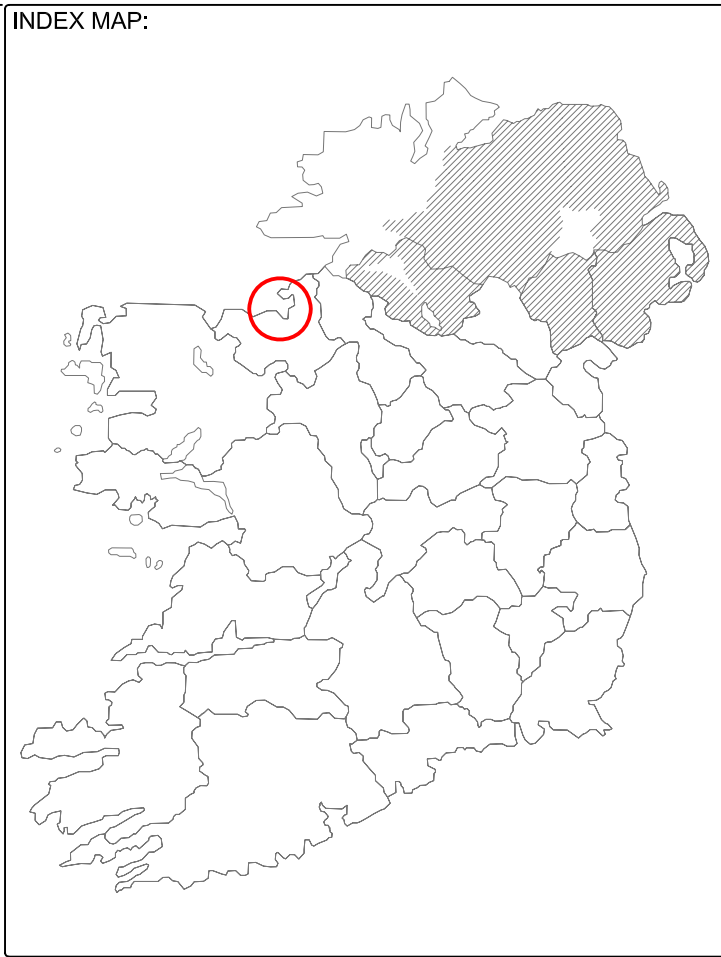
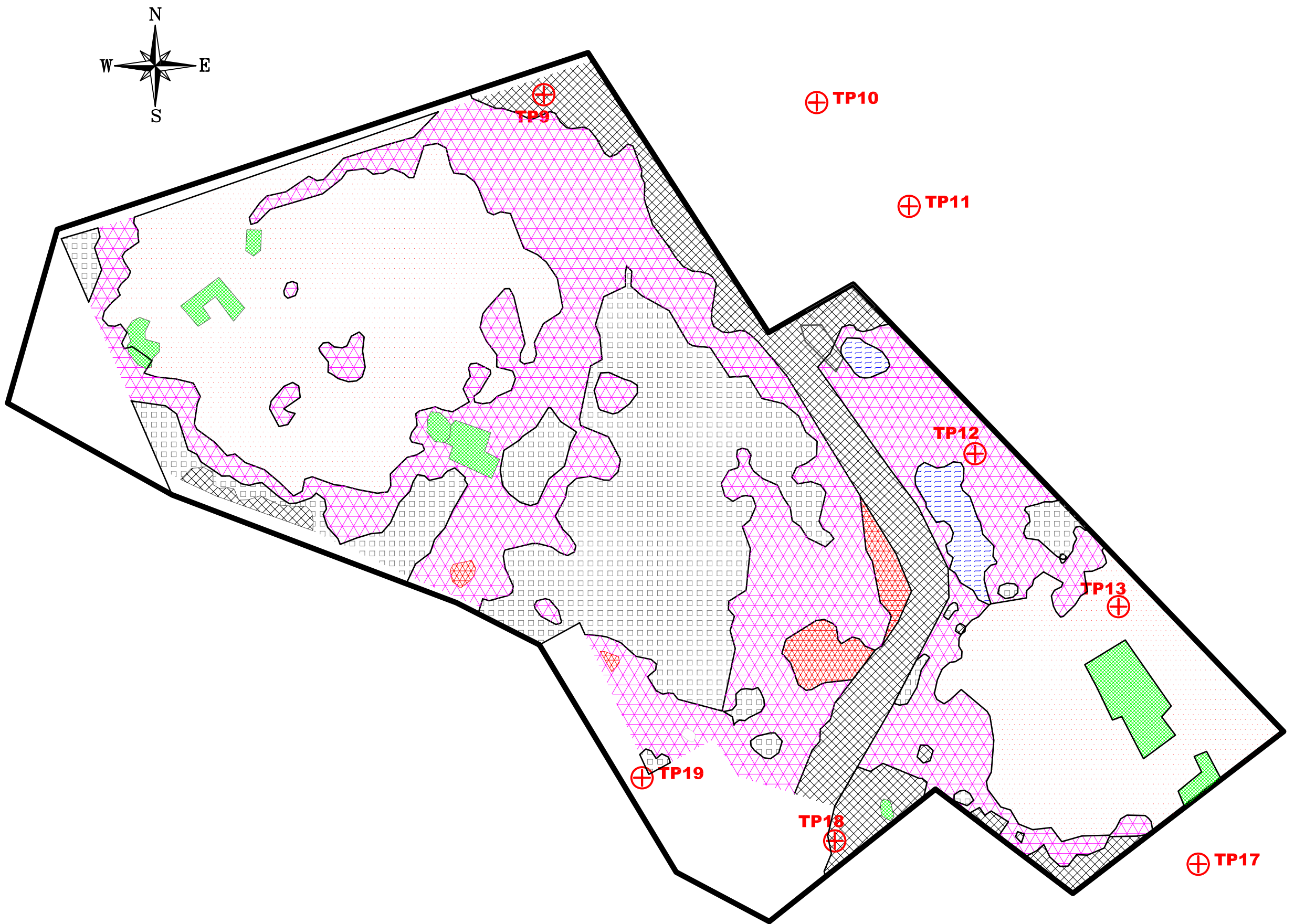


FIGURE 4: SUMMARY MAP  
Scale 1:2000



LEGEND:

- EM31 Conductivity Station
- Magnetic Profile
- 2D Resistivity Profile
- Seismic Profile
- Metal Object Noted on Surface
- Trial Pit from 1999
- Predominantly Organic Waste Material
- Fill comprising sandy Silt/Clay mixed with C&D Waste and Organic Waste material
- Fill with increased C&D Waste
- Conductive/Metallic material on Surface
- Cultural Noise (above ground interference)
- Subsurface Metal Objects from Inphase Values
- Ponded Water & Saturated Ground

NOTES:

|                                                         |          |                    |          |
|---------------------------------------------------------|----------|--------------------|----------|
| TITLE:                                                  |          | GEOPHYSICAL SURVEY |          |
| PROJECT: FINISKLIN LANDFILL, SLIGO                      |          |                    |          |
| CLIENT: MALONE O'REGAN                                  |          |                    |          |
| DRAWING: INTERPRETATION<br>OF GEOPHYSICAL INVESTIGATION |          |                    |          |
| DRAWING NUMBER:<br>8349_01                              |          |                    |          |
| SCALE:                                                  |          | 1:2000             |          |
| DATE:<br>25 MAY 2008                                    |          |                    |          |
| DRAWN: YOC                                              |          | CHECKED: AT        |          |
| REVISION:                                               | DATE:    | DRAWN:             | CHECKED: |
| V3                                                      | 12-10-10 | YOC                |          |
|                                                         |          |                    |          |
|                                                         |          |                    |          |
|                                                         |          |                    |          |
|                                                         |          |                    |          |

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E info@apexgeoservices.co.uk  
www.apexgeoservices.co.uk



FIGURE 4: SUMMARY MAP  
Scale 1:2000

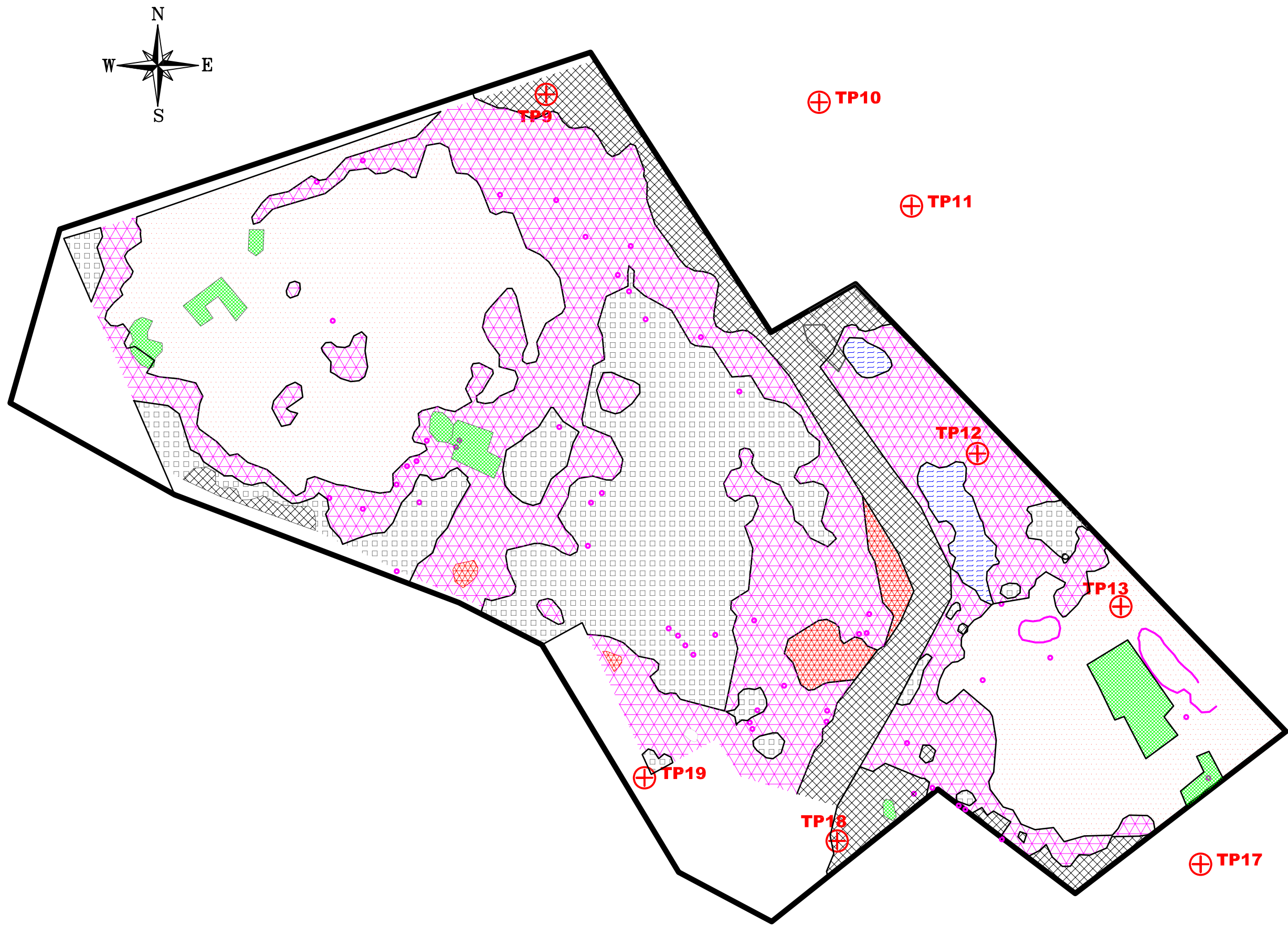
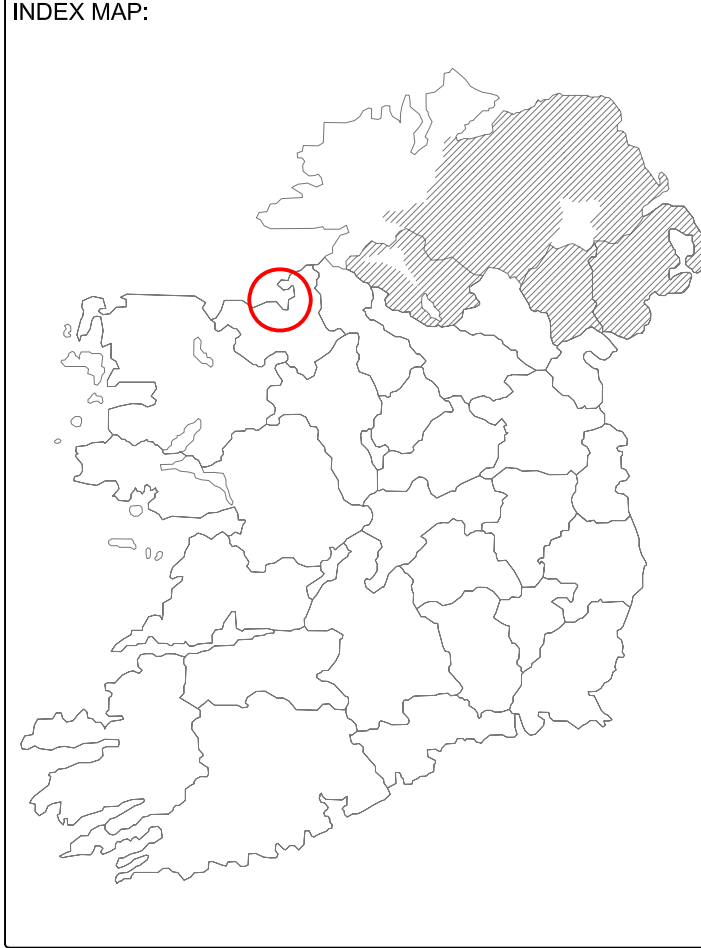
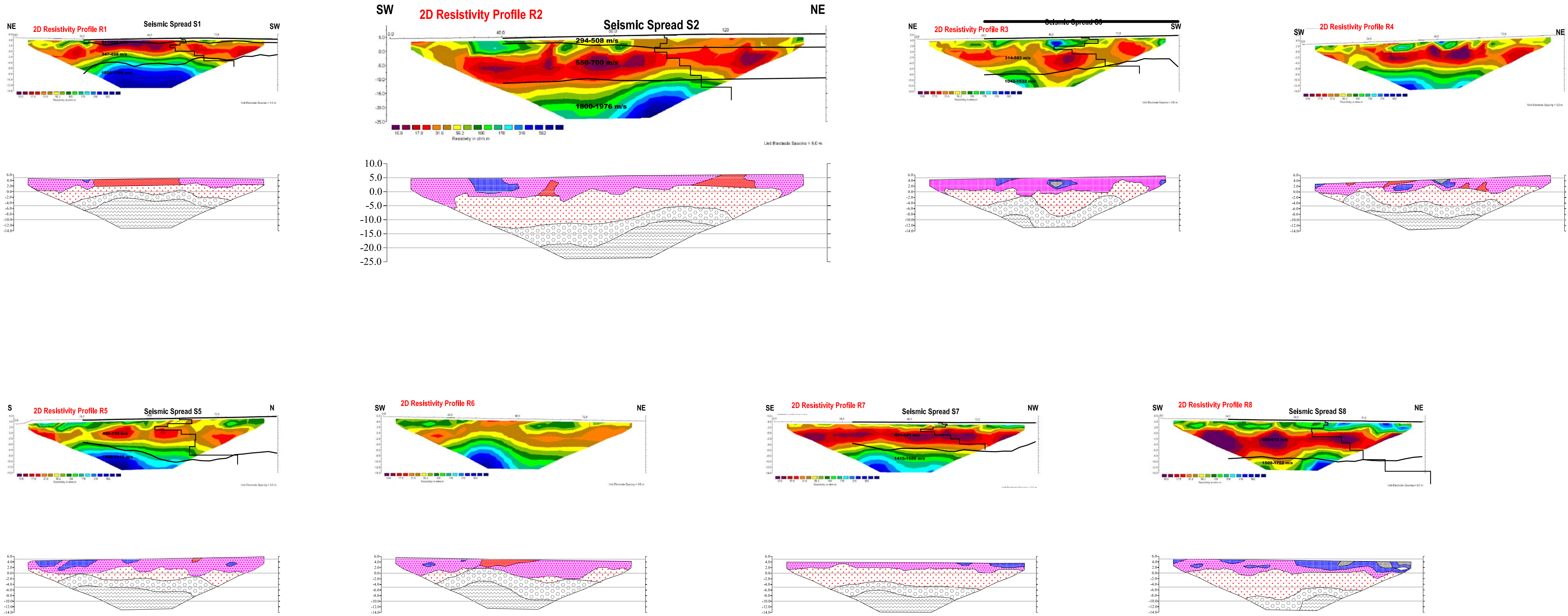


FIGURE 5: INTERPRETED RESISTIVITY & SEISMIC PROFILES  
Scale 1:1000



LEGEND:

- EM31 Conductivity Station
- Magnetic Profile
- 2D Resistivity Profile
- Seismic Profile
- Metal Object Noted on Surface
- Trial Pit from 1999
- Organic Waste Material
- Fill comprising sandy Silt/Clay mixed with C&D Waste and Organic Waste material
- Fill comprising sandy Silt/Clay mixed with C&D Waste
- Fill comprising predominantly C&D Waste
- Estuarine Silts and Sands
- Saturated Sands and Gravels or Possible Highly Weathered Shale
- Probable Moderately Weathered Shale

NOTES:

|                                    |          |          |          |
|------------------------------------|----------|----------|----------|
| TITLE: GEOPHYSICAL SURVEY          |          |          |          |
| PROJECT: FINISKLIN LANDFILL, SLIGO |          |          |          |
| CLIENT: MALONE O'REGAN             |          |          |          |
| DRAWING: INTERPRETED SECTIONS      |          |          |          |
| DRAWING NUMBER: 8349_02            |          |          |          |
| SCALE: AS SHOWN                    |          |          |          |
| DATE: 25 MAY 2008                  |          |          |          |
| DRAWN: YOC                         |          | CHECKED: |          |
| REVISION:                          | DATE:    | DRAWN:   | CHECKED: |
| V3                                 | 12-10-10 | YOC      |          |
|                                    |          |          |          |
|                                    |          |          |          |
|                                    |          |          |          |

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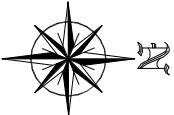
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# APPENDIX E

Survey Coordinates E.N.Z  
are directly related to the  
national grid values via  
a GPRS link to OS Beacon  
Stations



Site Location Map



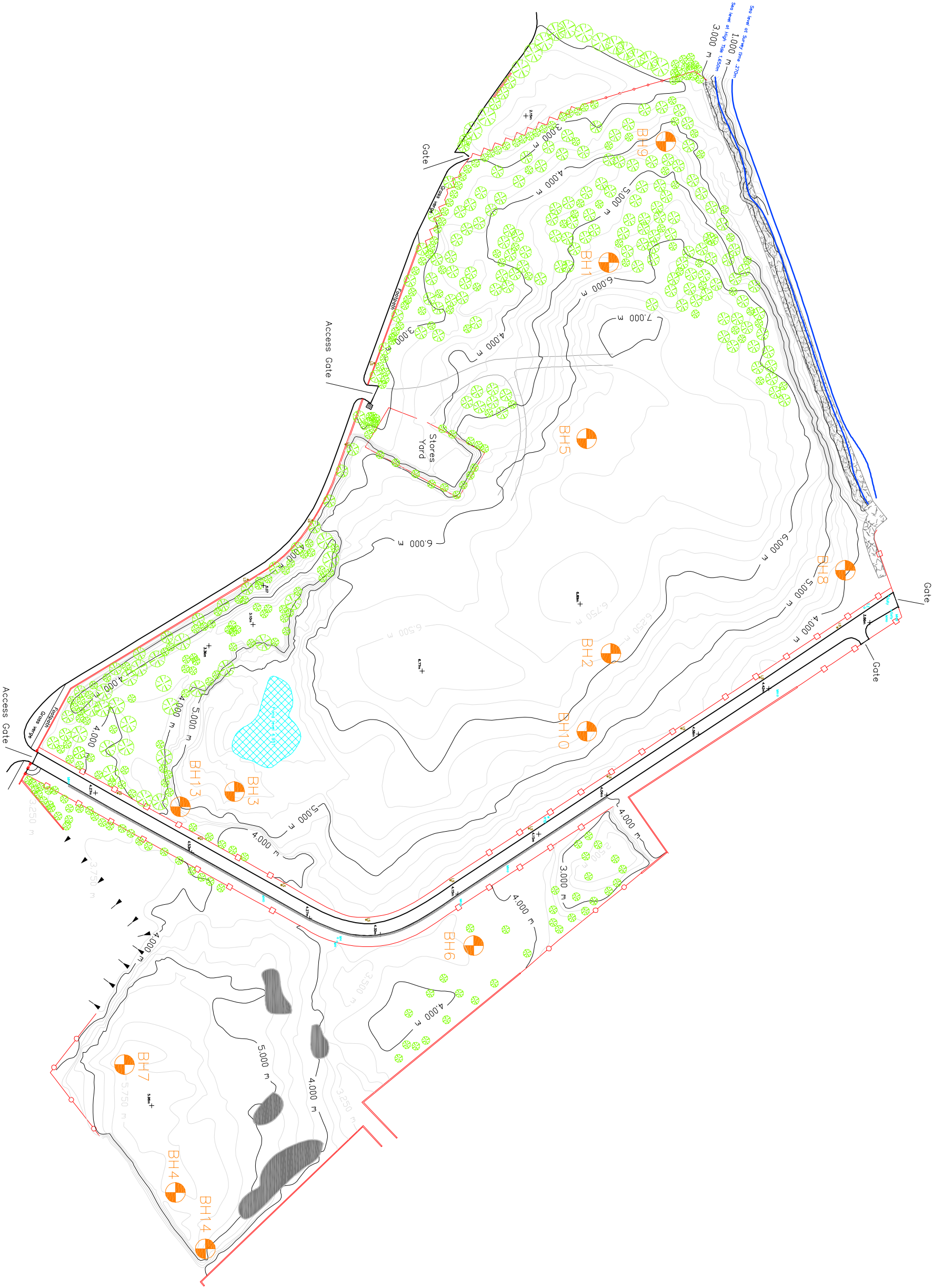
| Map Key               | Feature |
|-----------------------|---------|
| Tree line             |         |
| Vert. timber fence    |         |
| Security fence        |         |
| Spot heights          |         |
| Contours              |         |
| Buildings             |         |
| Bank                  |         |
| Spoil Humps           |         |
| Lump Standard         |         |
| Cont. Post/Rail fence |         |
| Stone Drain           |         |
| Trackway              |         |
| Boundary wall         |         |
| Bereholes             |         |

Title: Topographical Survey  
on a landfill site in  
Finisklin,Sligo Town.

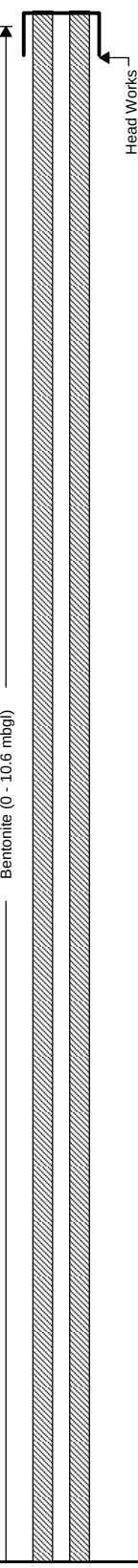
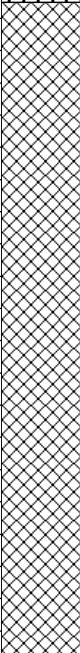
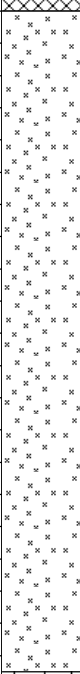
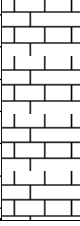
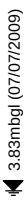
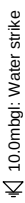
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Location :Sligo Town  
Job no.: MORCECB1  
Client : Malone O'Regan Engineers.  
Drawn by : CB  
Date : 10-07-09  
Scale : 1:2000@A3

Commac Bruton DipGeoSurv.  
Consultant Land Surveyor

Clonacilly,  
Ballymurey,  
Co. Roscommon,  
Tel. 0966651947  
Mob: 0879931297  
email: commacbruton@hotmail.com



## APPENDIX F

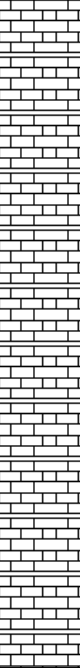
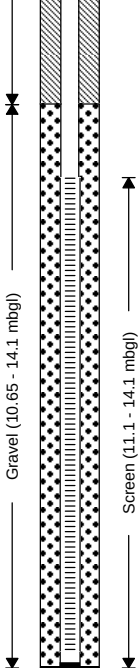
| BOREHOLE LOG                            |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |                                                                                      |
|-----------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Project Number: EO715                   |                                                                                     |                                                                                   | Client: Sligo County Council                                    |                                                                                                                                                                                                                                |              | BOREHOLE NO: BH1                                                                                                                                                                                         |                                                                                      |
| Project Title: Environmental Assessment |                                                                                     |                                                                                   | Site Location: Finisklin                                        |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              | SAMPLE                                                                                                                                                                                                   |                                                                                      |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                       | COMMENTS                                                        | WATER (mbgl)                                                                                                                                                                                                                   | Depth (mbgl) | PID (ppm)                                                                                                                                                                                                | INSTALLATION DETAILS                                                                 |
| 0                                       |    | MADEGROUND<br>Brown gravelly SAND.                                                | 0 - 6 mbgl: Little/ no capping on waste material. Much plastic. |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |  |
| 1                                       |                                                                                     | MADEGROUND (Mixed waste).<br>Black sludge with much plastic and rare metal. Damp. |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 2                                       |   |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 3                                       |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 4                                       |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 5                                       |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 6                                       |  | Soft black/grey sandy SILT. Damp.                                                 |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          | Bentonite (0 - 10.6 mbgl)                                                            |
| 7                                       |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 8                                       |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 9                                       |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |
| 10                                      |  | Black weathered LIMESTONE with some clay infill.                                  | 8.7 mbgl: Angular muddy weathered bedrock.                      |  3.83mbgl (07/07/2009)<br><br> 10.0mbgl: Water strike |              |                                                                                                                                                                                                          |                                                                                      |
|                                         |                                                                                     |                                                                                   |                                                                 |                                                                                                                                                                                                                                |              |                                                                                                                                                                                                          |                                                                                      |

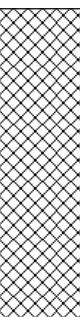
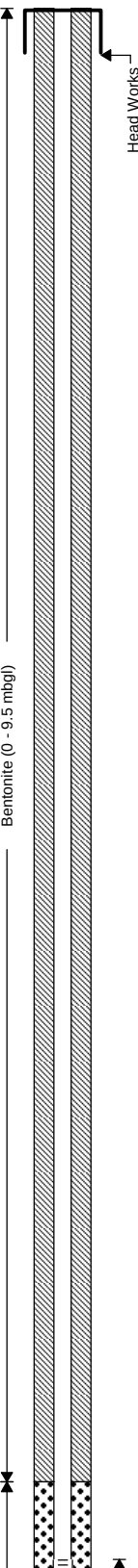
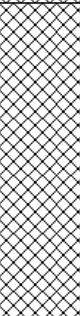
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| Logged By: GO'D<br>Checked By: CC                                             |                                                                                                  |                                                                                                                                                                                                                                                       |

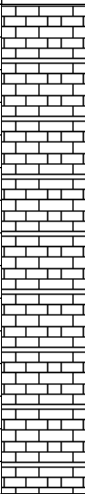
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|-------------------------------------------------------------------------------|--------|-------------|--------------------------------------------------------------------------------------------------|-----------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------------------|
| <div>BOREHOLE LOG</div>                                                       |        |             |                                                                                                  |                 |                 | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |                                                                           |                      |
| Project Number: EO715                                                         |        |             | Client: Sligo County Council                                                                     |                 |                 | BOREHOLE NO: BH1                                                                                                                                                     |                                                                           |                      |
| Project Title: Environmental Assessment                                       |        |             | Site Location: Finisklin                                                                         |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| SUBSURFACE CONDITIONS                                                         |        |             |                                                                                                  |                 |                 | SAMPLE                                                                                                                                                               |                                                                           | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                               | SYMBOL | DESCRIPTION | COMMENTS                                                                                         | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                         |                                                                           |                      |
| 11                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      | <div>Gravel (10.6 - 14.0 mbgl)</div> <div>Screen (11.0 - 14.0 mbgl)</div> |                      |
| 12                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 13                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 14                                                                            |        |             | End of hole - 14.1mbgl.                                                                          |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 15                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 16                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 17                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 18                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 19                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| 20                                                                            |        |             |                                                                                                  |                 |                 |                                                                                                                                                                      |                                                                           |                      |
| Drill Date: 16-06-2009<br>Drill Method: Air Rotary<br>Drilled By: JS Drilling |        |             | Reference Datum: maOD<br>Elevation: 5.57 mAOD toc<br>Easting: 167555.531<br>Northing: 337116.791 |                 |                 | Water Strike: 10.0 mbgl<br>Strike:  Level:                                                                                                                           |                                                                           |                      |
| Logged By: GO'D<br>Checked By: CC                                             |        |             |                                                                                                  |                 |                 | Revision: Final      Page: 2 of 2                                                                                                                                    |                                                                           |                      |



|                                                                               |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
|-------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| BOREHOLE LOG                                                                  |  |                                                                                     |                                                                                                  |                                    |                        |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> <div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div>       |           |
| Project Number: EO715                                                         |  |                                                                                     | Client: Sligo County Council                                                                     |                                    |                        | BOREHOLE NO: BH2                                                                                                                                                                                                     |           |
| Project Title: Environmental Assessment                                       |  |                                                                                     | Site Location: Finisklin                                                                         |                                    |                        |                                                                                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                                                         |  |                                                                                     |                                                                                                  |                                    |                        | SAMPLE                                                                                                                                                                                                               |           |
| Depth (mbgl)                                                                  |  | SYMBOL                                                                              | DESCRIPTION                                                                                      | COMMENTS                           | WATER (mbgl)           | Depth (mbgl)                                                                                                                                                                                                         | PID (ppm) |
| 0                                                                             |  |    | MADEGROUND<br>Brown gravelly CLAY.                                                               | 0 - 7.5 mbgl: Much plastic.        |                        |                                                                                                                                                                                                                      |           |
| 1                                                                             |  |                                                                                     | MADEGROUND<br>Black CLAY matrix with some plastic, metal, brick and concrete.                    |                                    |                        |                                                                                                                                                                                                                      |           |
| 2                                                                             |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| 3                                                                             |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| 4                                                                             |  |  | MADEGROUND<br>Black waste with rare clay matrix.                                                 |                                    | 4.69mbgl (07/07/2009)  |                                                                                                                                                                                                                      |           |
| 5                                                                             |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| 6                                                                             |  |  | Brown slightly sandy slightly gravelly CLAY.                                                     | 7.5 mbgl: Hydrogen sulphide odour. | 9.6mbgl: Water strike. |                                                                                                                                                                                                                      |           |
| 7                                                                             |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| 8                                                                             |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| 9                                                                             |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| 10                                                                            |  |                                                                                     |                                                                                                  |                                    |                        |                                                                                                                                                                                                                      |           |
| Drill Date: 16-06-2009<br>Drill Method: Air Rotary<br>Drilled By: JS Drilling |  |                                                                                     | Reference Datum: maOD<br>Elevation: 6.34 maOD toc<br>Easting: 167751.905<br>Northing: 337117.859 |                                    |                        | Water Strike: 9.6 mbgl<br>Strike:  Level:  |           |
| Logged By: GOD<br>Checked By: CC                                              |  |                                                                                     |                                                                                                  |                                    |                        | Revision: Final Page: 1 of 2                                                                                                                                                                                         |           |

|                                                                               |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------|-----------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------|
| <div>BOREHOLE LOG</div>                                                       |                                                                                    |                         |                                                                                                  |                 |                 | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div>                                                 |                                                                                      |                      |
| Project Number: EO715                                                         |                                                                                    |                         | Client: Sligo County Council                                                                     |                 |                 | BOREHOLE NO: BH2                                                                                                                                                                                                     |                                                                                      |                      |
| Project Title: Environmental Assessment                                       |                                                                                    |                         | Site Location: Finisklin                                                                         |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| SUBSURFACE CONDITIONS                                                         |                                                                                    |                         |                                                                                                  |                 |                 | SAMPLE                                                                                                                                                                                                               |                                                                                      | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                               | SYMBOL                                                                             | DESCRIPTION             | COMMENTS                                                                                         | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                                                                         |                                                                                      |                      |
| 11                                                                            |  | Black LIMESTONE.        |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |  |                      |
| 12                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 13                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 14                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 14                                                                            |                                                                                    | End of hole - 14.1mbgl. |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 15                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 16                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 17                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 18                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 19                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| 20                                                                            |                                                                                    |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                      |                                                                                      |                      |
| Drill Date: 16-06-2009<br>Drill Method: Air Rotary<br>Drilled By: JS Drilling |                                                                                    |                         | Reference Datum: maOD<br>Elevation: 6.34 maOD toc<br>Easting: 167751.905<br>Northing: 337117.859 |                 |                 | Water Strike: 9.6 mbgl<br>Strike:  Level:  |                                                                                      |                      |
| Logged By: GO'D<br>Checked By: CC                                             |                                                                                    |                         |                                                                                                  |                 |                 | Revision: Final      Page: 2 of 2                                                                                                                                                                                    |                                                                                      |                      |

| BOREHOLE LOG                                                                  |                                                                                     |                                                           |                                                                                                  |                         |              | <div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div> <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div>                                                          |                                                                                      |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Project Number: EO715                                                         |                                                                                     |                                                           | Client: Sligo County Council                                                                     |                         |              | BOREHOLE NO: BH3                                                                                                                                                                                                    |                                                                                      |
| Project Title: Environmental Assessment                                       |                                                                                     |                                                           | Site Location: Finisklin                                                                         |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| SUBSURFACE CONDITIONS                                                         |                                                                                     |                                                           |                                                                                                  |                         | SAMPLE       |                                                                                                                                                                                                                     | INSTALLATION DETAILS                                                                 |
| Depth (mbgl)                                                                  | SYMBOL                                                                              | DESCRIPTION                                               | COMMENTS                                                                                         | WATER (mbgl)            | Depth (mbgl) | PID (ppm)                                                                                                                                                                                                           |                                                                                      |
| 0                                                                             |    | MADEGROUND<br>Soft slightly gravelly CLAY.                |                                                                                                  |                         |              |                                                                                                                                                                                                                     |  |
| 1                                                                             |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 2                                                                             |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 3                                                                             |   | MADEGROUND (Waste).<br>Black waste with some clay matrix. |                                                                                                  | 4.04mbgl (07/07/2009)   |              |                                                                                                                                                                                                                     |                                                                                      |
| 4                                                                             |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 5                                                                             |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 6                                                                             |  | Soft black slightly gravelly SILT.                        |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 7                                                                             |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 8                                                                             |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| 9                                                                             |  | Grey LIMESTONE.                                           |                                                                                                  | 8.3mbgl - Water strike. |              |                                                                                                                                                                                                                     |                                                                                      |
| 10                                                                            |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
|                                                                               |                                                                                     |                                                           |                                                                                                  |                         |              |                                                                                                                                                                                                                     |                                                                                      |
| Drill Date: 17-06-2009<br>Drill Method: Air Rotary<br>Drilled By: JS Drilling |                                                                                     |                                                           | Reference Datum: maOD<br>Elevation: 5.92 maOD toc<br>Easting: 167821.302<br>Northing: 336928.729 |                         |              | Water Strike: 8.3mbgl<br>Strike:  Level:  |                                                                                      |
| Logged By: G'O'D<br>Checked By: CC                                            |                                                                                     |                                                           |                                                                                                  |                         |              | Revision: Final      Page: 1 of 2                                                                                                                                                                                   |                                                                                      |

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| <div>BOREHOLE LOG</div>                                                       |                                                                                   |                         |                                                                                                  |                 |                 | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div>                                                |                                                                                    |                      |
| Project Number: EO715                                                         |                                                                                   |                         | Client: Sligo County Council                                                                     |                 |                 | BOREHOLE NO: BH3                                                                                                                                                                                                    |                                                                                    |                      |
| Project Title: Environmental Assessment                                       |                                                                                   |                         | Site Location: Finisklin                                                                         |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| SUBSURFACE CONDITIONS                                                         |                                                                                   |                         |                                                                                                  |                 |                 | SAMPLE                                                                                                                                                                                                              |                                                                                    | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                               | SYMBOL                                                                            | DESCRIPTION             | COMMENTS                                                                                         | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                                                                        |                                                                                    |                      |
| 11                                                                            |  |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     | <div><div>Gravel (9.5 - 13.0 mbgl)</div><div>Screen (10.0 - 13.0 mbgl)</div></div> |                      |
| 12                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 13                                                                            |                                                                                   | End of hole - 13.0mbgl. |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 14                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 15                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 16                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 17                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 18                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 19                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| 20                                                                            |                                                                                   |                         |                                                                                                  |                 |                 |                                                                                                                                                                                                                     |                                                                                    |                      |
| Drill Date: 17-06-2009<br>Drill Method: Air Rotary<br>Drilled By: JS Drilling |                                                                                   |                         | Reference Datum: maOD<br>Elevation: 5.92 maOD toc<br>Easting: 167821.302<br>Northing: 336928.729 |                 |                 | Water Strike: 8.3mbgl<br>Strike:  Level:  |                                                                                    |                      |
| Logged By: GO'D<br>Checked By: CC                                             |                                                                                   |                         |                                                                                                  |                 |                 | Revision: Final      Page: 2 of 2                                                                                                                                                                                   |                                                                                    |                      |

|                                                                                            |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
|--------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------|
| <div>BOREHOLE LOG</div>                                                                    |                        |                                                                         |                                                                                                                |                                  |                 | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |                                                                   |                      |
| Project Number: EO715                                                                      |                        |                                                                         | Client: Sligo County Council                                                                                   |                                  |                 | BOREHOLE NO: BH4                                                                                                                                                     |                                                                   |                      |
| Project Title: Environmental Assessment                                                    |                        |                                                                         | Site Location: Finisklin                                                                                       |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| SUBSURFACE CONDITIONS                                                                      |                        |                                                                         |                                                                                                                |                                  |                 | SAMPLE                                                                                                                                                               |                                                                   | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                                            | SYMBOL                 | DESCRIPTION                                                             | COMMENTS                                                                                                       | WATER<br>(mbgl)                  | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                         |                                                                   |                      |
| 0                                                                                          |                        | MADEGROUND.<br>Hardcore.                                                |                                                                                                                | <div>3.96mbgl (07/07/2009)</div> |                 |                                                                                                                                                                      | <div><div><div></div><div></div></div><div>Head Works</div></div> |                      |
| 1                                                                                          |                        | MADEGROUND.<br>Black/brown slightly sandy CLAY.                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 2                                                                                          |                        | MADEGROUND (Waste).<br>Mixed waste. Black waste with plastic,<br>metal. |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 3                                                                                          |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 4                                                                                          |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 5                                                                                          | Grey GRAVEL and SANDS. |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 6                                                                                          |                        | Soft grey slightly sandy slightly gravelly<br>SILT.                     |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 7                                                                                          |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 8                                                                                          |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 9                                                                                          |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| 10                                                                                         |                        |                                                                         |                                                                                                                |                                  |                 |                                                                                                                                                                      |                                                                   |                      |
| <div>Drill Date: 17-06-2009<br/>Drill Method: Air Rotary<br/>Drilled By: JS Drilling</div> |                        |                                                                         | <div>Reference Datum: maOD<br/>Elevation: 5.92 maOD toc<br/>Easting: 168022.738<br/>Northing: 336898.975</div> |                                  |                 | <div>Water Strike: 10.7mbgl<br/>Strike:  Level: </div> <div>Revision: FinalPage: 1 of 2</div>                                                                        |                                                                   |                      |



|                                                                               |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
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| <div>BOREHOLE LOG</div>                                                       |        |                              |                                                                                                  |                         | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |           |                      |
| Project Number: EO715                                                         |        | Client: Sligo County Council |                                                                                                  |                         | BOREHOLE NO: BH4                                                                                                                                                     |           |                      |
| Project Title: Environmental Assessment                                       |        | Site Location: Finisklin     |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| SUBSURFACE CONDITIONS                                                         |        |                              |                                                                                                  |                         | SAMPLE                                                                                                                                                               |           | INSTALLATION DETAILS |
| Depth (mbgl)                                                                  | SYMBOL | DESCRIPTION                  | COMMENTS                                                                                         | WATER (mbgl)            | Depth (mbgl)                                                                                                                                                         | PID (ppm) |                      |
| 11                                                                            |        | Weathered LIMESTONE bedrock. |                                                                                                  | 10.7mbgl: Water strike. |                                                                                                                                                                      |           |                      |
| 12                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 13                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 14                                                                            |        | End of hole - 14.0mbgl.      |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 15                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 16                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 17                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 18                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 19                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| 20                                                                            |        |                              |                                                                                                  |                         |                                                                                                                                                                      |           |                      |
| Drill Date: 17-06-2009<br>Drill Method: Air Rotary<br>Drilled By: JS Drilling |        |                              | Reference Datum: maOD<br>Elevation: 5.92 maOD toc<br>Easting: 168022.738<br>Northing: 336898.975 |                         | Water Strike: 10.7mbgl<br>Strike:  Level:                                                                                                                            |           |                      |
| Logged By: GO'D<br>Checked By: CC                                             |        |                              |                                                                                                  |                         | Revision: Final      Page: 2 of 2                                                                                                                                    |           |                      |

BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH5

SUBSURFACE CONDITIONS

Depth (mbgl)

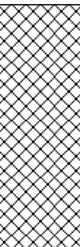
SYMBOL

DESCRIPTION

COMMENTS

WATER (mbgl)

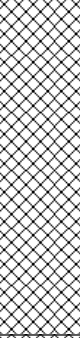
0



MADEGROUND.  
Firm brown/ grey slightly sandy gravelly CLAY with some cobbles. Cobbles of limestone. Gravel of limestone, brick and concrete. Damp.

0 - 0.8 mbgl: Some timber.

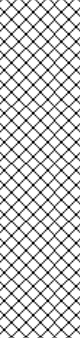
1



MADEGROUND.  
Soft black stained slightly gravelly sandy CLAY with much plastic.

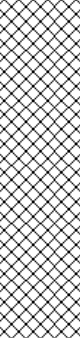
0.8 - 1.9 mbgl: Waste plastic and some timber.

2

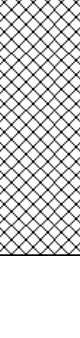


MADEGROUND (Municipal Waste).  
Black sandy sludge matrix with plastic abundant. Moist.

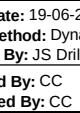
3



4



5



End of hole - 5.0 mbgl.

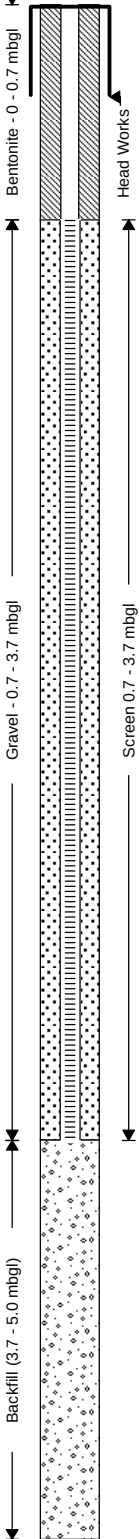
5.0 mbgl: Refusal.

SAMPLE

Depth (mbgl)

PID (ppm)

INSTALLATION DETAILS



Drill Date: 19-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Reference Datum: maOD

Elevation: 7.02 maOD toc

Easting: 167643.923

Northing: 337105.651

Water Strike: NA

Strike:  Level: 

Revision: Final

Page: 1 of 1

DISCLAIMER: This log is for environmental purposes only.

BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

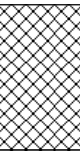
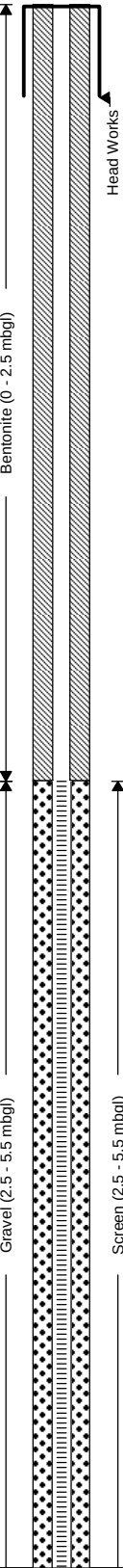
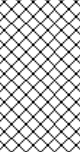
Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH6

| SUBSURFACE CONDITIONS |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              | SAMPLE       |           | INSTALLATION DETAILS                                                                 |
|-----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------|-----------|--------------------------------------------------------------------------------------|
| Depth (mbgl)          | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                       | COMMENTS                                                                                                                      | WATER (mbgl)                                                                                                 | Depth (mbgl) | PID (ppm) |                                                                                      |
| 0                     |    | MADEGROUND.<br>Soft brown slightly gravelly sandy CLAY/ SILT with some cobbles. Gravel is of limestone and brick. Cobbles are of limestone. Damp.                 | 0-0.45 mbgl: C&D waste (timber, brick less than 30%).                                                                         |                                                                                                              |              |           |  |
| 1                     |                                                                                     | MADEGROUND (C&D waste).<br>Soft dark brown/ grey slightly sandy gravelly CLAY with occasional cobbles. Gravel and cobbles of brick, limestone and concrete. Damp. | 0.45 - 1.8 mbgl: C&D waste (30%). Some ceramic, timber and plastic. Organic decay odour and black staining.                   |                                                                                                              |              |           |                                                                                      |
| 2                     |                                                                                     | MADEGROUND.<br>Black sandy GRAVEL with ashy texture with some pockets of black/brown CLAY/ SILT. Wet.                                                             | 1.8 - 5.6 mbgl: 60% waste moderately decomposed with some plastic containers, wrapping and occasional paper, brick and metal. |                                                                                                              |              |           |                                                                                      |
| 3                     |  |                                                                                                                                                                   |                                                                                                                               |  3.5 mbgl: Water strike |              |           |                                                                                      |
| 4                     |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
| 5                     |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |
|                       |                                                                                     |                                                                                                                                                                   |                                                                                                                               |                                                                                                              |              |           |                                                                                      |

Drill Date: 18-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Logged By: CC

Checked By: EB

Reference Datum: maOD

Elevation: 4.45 maOD toc

Easting: 167898.734

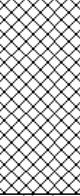
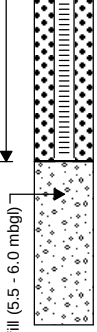
Northing: 337048.908

Water Strike: 3.5 mbgl

Strike:  Level: 

Revision: Final Page: 1 of 2

DISCLAIMER: This log is for environmental purposes only.

|                                                                                  |                                                                                   |                                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------|
| <h1>BOREHOLE LOG</h1>                                                            |                                                                                   |                                                                   |                                                                                                  |                 |                 | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div><div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div></div> |                                                                                                                  |                      |
| Project Number: EO715                                                            |                                                                                   |                                                                   | Client: Sligo County Council                                                                     |                 |                 | BOREHOLE NO: BH6                                                                                                                                                                                                        |                                                                                                                  |                      |
| Project Title: Environmental Assessment                                          |                                                                                   |                                                                   | Site Location: Finisklin                                                                         |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| SUBSURFACE CONDITIONS                                                            |                                                                                   |                                                                   |                                                                                                  |                 |                 | SAMPLE                                                                                                                                                                                                                  |                                                                                                                  | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                                  | SYMBOL                                                                            | DESCRIPTION                                                       | COMMENTS                                                                                         | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                                                                            |                                                                                                                  |                      |
|                                                                                  |  |                                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         | <br>Backfill (5.5 - 6.0 mbgl) |                      |
|                                                                                  |  | Grey silty SAND with some lenses of sandy silt. Some shells. Wet. |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| 6                                                                                |                                                                                   | End of hole - 6.0 mbgl.                                           | 6.0 mbgl: Refusal.                                                                               |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| 7                                                                                |                                                                                   |                                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| 8                                                                                |                                                                                   |                                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| 9                                                                                |                                                                                   |                                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| 10                                                                               |                                                                                   |                                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                                                  |                      |
| Drill Date: 18-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling |                                                                                   |                                                                   | Reference Datum: maOD<br>Elevation: 4.45 maOD toc<br>Easting: 167898.734<br>Northing: 337048.908 |                 |                 | Water Strike: 3.5 mbgl<br>Strike:  Level:     |                                                                                                                  |                      |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                   |                                                                   |                                                                                                  |                 |                 | Revision: Final      Page: 2 of 2                                                                                                                                                                                       |                                                                                                                  |                      |

BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH7

SUBSURFACE CONDITIONS

Depth (mbgl)

SYMBOL

DESCRIPTION

COMMENTS

WATER (mbgl)

Depth (mbgl)

PID (ppm)

INSTALLATION DETAILS

0

MADEGROUND.  
Soft brown/ grey slightly sandy slightly gravelly CLAY with some cobbles. Gravel and cobbles are of limestone and brick. Damp.

MADEGROUND.  
GRAVEL and COBBLES of limestone.

MADEGROUND.  
Soft dark brown slightly sandy slightly gravelly SILT with some cobbles. Gravel and cobbles are of limestone. Damp.

0 - 0.15 mbgl: Some black mottling.

0.3 - 1.4 mbgl: Some gravel of brick, concrete, glass and ceramic. Some timber fragments. Some black staining.

0.8mbgl: Occasional black/orange mottling. Becoming moist.

0.8 mbgl: No olfactory or visual evidence of contamination.

1.2mbgl: Some organic detritus.

1.4 - 1.7 mbgl: Waste of some glass, plastic and timber with occasional ashy matrix. Low to moderate decomposition.

1

MADEGROUND.  
Black sandy GRAVEL matrix with rare lenses of sandy clay and Municipal/ C&D waste (40%). Wet.

3.7 mbgl: Refusal.

Head Works

Bentonite - 0 - 1.6 mbgl

Gravel - 1.6 - 3.2 mbgl

Screen - 1.7 - 3.2 mbgl

Backfill (3.2 - 3.7 mbgl)

End of hole - 3.7 mbgl.

Drill Date: 18-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Reference Datum: maOD

Elevation: 6.06 maOD toc

Easting: 167958.572

Northing: 336873.297

Water Strike: NA

Strike:  Level: 

Revision: Final

Page: 1 of 1

Logged By: CC

Checked By: EB

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BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

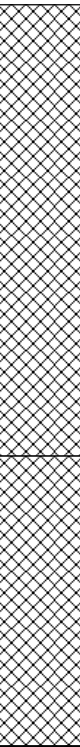
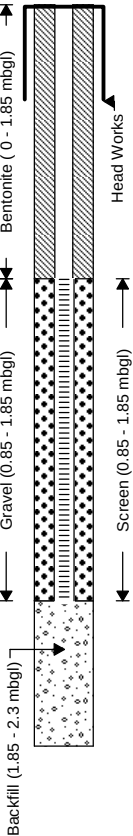
Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH8

| SUBSURFACE CONDITIONS |                                                                                    |                                                                                                                                                            |                         |              | SAMPLE       |           | INSTALLATION DETAILS                                                                 |
|-----------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------|--------------|-----------|--------------------------------------------------------------------------------------|
| Depth (mbgl)          | SYMBOL                                                                             | DESCRIPTION                                                                                                                                                | COMMENTS                | WATER (mbgl) | Depth (mbgl) | PID (ppm) |                                                                                      |
| 0                     |  | MADEGROUND.<br>Soft to firm brown/ grey slightly gravelly sandy CLAY with some cobbles. Gravel and cobbles of brick, concrete, limestone and timber. Damp. | 0-1.4mbgl: Rare timber. |              |              |           |  |
| 1                     |                                                                                    | MADEGROUND.<br>Black sludgy matrix with much plastic. Damp.                                                                                                |                         |              |              |           |                                                                                      |
| 2                     | End of hole - 2.3mbgl.                                                             |                                                                                                                                                            | 2.3 mbgl: Refusal.      |              |              |           |                                                                                      |
| 3                     |                                                                                    |                                                                                                                                                            |                         |              |              |           |                                                                                      |
| 4                     |                                                                                    |                                                                                                                                                            |                         |              |              |           |                                                                                      |
| 5                     |                                                                                    |                                                                                                                                                            |                         |              |              |           |                                                                                      |

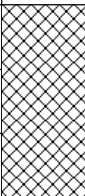
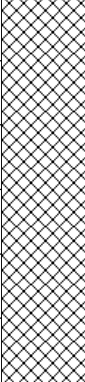
Drill Date: 19-06-2009  
Drill Method: Dynamic Probe  
Drilled By: JS Drilling

Logged By: CC  
Checked By: EB

Reference Datum: maOD  
Elevation: 4.54 maOD toc  
Easting: 167710.072  
Northing: 337235.728

Water Strike: NA  
Strike:  Level:   
Revision: Final Page: 1 of 1

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| BOREHOLE LOG                            |                                                                                    |                                                                                                                                           |                                                                                                 |              |              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |                      |
|-----------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Project Number: EO715                   |                                                                                    |                                                                                                                                           | Client: Sligo County Council                                                                    |              |              | BOREHOLE NO: BH9                                                                                                                                                                                         |                      |
| Project Title: Environmental Assessment |                                                                                    |                                                                                                                                           | Site Location: Finisklin                                                                        |              |              |                                                                                                                                                                                                          |                      |
| SUBSURFACE CONDITIONS                   |                                                                                    |                                                                                                                                           |                                                                                                 |              |              | SAMPLE                                                                                                                                                                                                   |                      |
| Depth (mbgl)                            | SYMBOL                                                                             | DESCRIPTION                                                                                                                               | COMMENTS                                                                                        | WATER (mbgl) | Depth (mbgl) | PID (ppm)                                                                                                                                                                                                | INSTALLATION DETAILS |
| 0                                       |   | MADEGROUND.<br>Stiff to firm brown slightly gravelly sandy CLAY/ SILT with some cobbles. Gravel and cobbles of limestone and brick. Damp. | 0-0.6mbgl - Grey and white mottling with some orange (oxidation) flecks. Some organic detritus. |              |              |                                                                                                                                                                                                          |                      |
| 0.4-0.6mbgl                             |                                                                                    | Some black staining.                                                                                                                      |                                                                                                 |              |              |                                                                                                                                                                                                          |                      |
| 0.6-1.8mbgl                             |  | MADEGROUND (C&D Waste).<br>Black gravelly sand matrix with waste of timber and plastic with some gravel of limestone and brick. Damp.     | 0.6-1.8mbgl - Waste of concrete, rare timber fragments and much plastic.                        |              |              |                                                                                                                                                                                                          |                      |
| 1                                       |                                                                                    |                                                                                                                                           |                                                                                                 |              |              |                                                                                                                                                                                                          |                      |
| 1.8mbgl                                 |                                                                                    | End of hole - 1.8mbgl.                                                                                                                    | 1.8 mbgl: Refusal.                                                                              |              |              |                                                                                                                                                                                                          |                      |
| 2                                       |                                                                                    |                                                                                                                                           |                                                                                                 |              |              |                                                                                                                                                                                                          |                      |
| 3                                       |                                                                                    |                                                                                                                                           |                                                                                                 |              |              |                                                                                                                                                                                                          |                      |
| 4                                       |                                                                                    |                                                                                                                                           |                                                                                                 |              |              |                                                                                                                                                                                                          |                      |
| 5                                       |                                                                                    |                                                                                                                                           |                                                                                                 |              |              |                                                                                                                                                                                                          |                      |

|                                                                                  |                                                                                                  |                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drill Date: 19-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling | Reference Datum: maOD<br>Elevation: 4.61 maOD toc<br>Easting: 167494.621<br>Northing: 337145.469 | Water Strike: NA<br>Strike:  Level:  |
| Logged By: CC<br>Checked By: CC                                                  |                                                                                                  | Revision: Final      Page: 1 of 1                                                                                                                                                                              |

BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH10

| SUBSURFACE CONDITIONS |                                                                                     |                                                                                                                                                                           |                                                                                            |              |              | SAMPLE    |  | INSTALLATION DETAILS |
|-----------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------|--------------|-----------|--|----------------------|
| Depth (mbgl)          | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                               | COMMENTS                                                                                   | WATER (mbgl) | Depth (mbgl) | PID (ppm) |  |                      |
| 0                     |    | MADEGROUND.<br>Soft dark grey slightly gravelly sandy SILT with some cobbles. Damp.                                                                                       | 0.2-1.1mbgl : Rare organic detritus.                                                       |              |              |           |  |                      |
|                       |                                                                                     | MADEGROUND.<br>Soft to firm black/ grey slightly sandy slightly gravelly SILT with many cobbles. Damp.                                                                    |                                                                                            |              |              |           |  |                      |
| 1                     |    | MADEGROUND.<br>Firm brown slightly gravelly sandy CLAY/ SILT with occasional cobbles. Gravel and cobbles of limestone (30%) with some brick (15%) and timber (15%). Damp. | 1.1-2.8mbgl: Some brick and timber. Some black staining and orange flecks. Becoming moist. |              |              |           |  |                      |
|                       |                                                                                     |                                                                                                                                                                           |                                                                                            |              |              |           |  |                      |
| 2                     |  | MADEGROUND (Waste).<br>Recovery of brick and plastic.                                                                                                                     | 2.9mbgl : Refusal.                                                                         |              |              |           |  |                      |
| 3                     |                                                                                     | End of hole - 2.9mbgl.                                                                                                                                                    |                                                                                            |              |              |           |  |                      |
| 4                     |                                                                                     |                                                                                                                                                                           |                                                                                            |              |              |           |  |                      |
| 5                     |                                                                                     |                                                                                                                                                                           |                                                                                            |              |              |           |  |                      |

Drill Date: 19-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Reference Datum: maOD

Elevation: 5.74 maOD toc

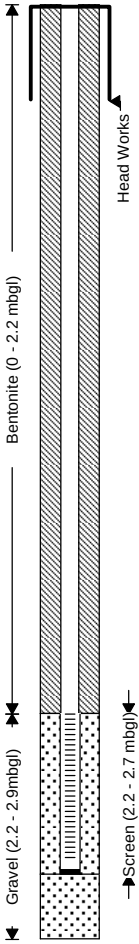
Easting: 167791.047

Northing: 337105.783

Water Strike: NA

Strike:  Level: 

Revision: Final Page: 1 of 1



Head Works

Bentonite (0 - 2.2 mbgl)

Gravel (2.2 - 2.9mbgl)

Screen (2.2 - 2.7 mbgl)

Drill Date: 19-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Logged By: CC

Checked By: EB

Reference Datum: maOD

Elevation: 5.74 maOD toc

Easting: 167791.047

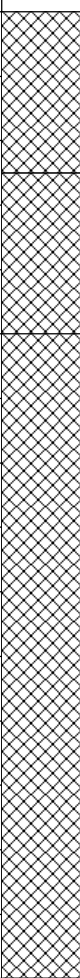
Northing: 337105.783

Water Strike: NA

Strike:  Level: 

Revision: Final Page: 1 of 1

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| BOREHOLE LOG                            |                                                                                    |                                                                                             |                              |              |              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |                      |
|-----------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------|--------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Project Number: EO715                   |                                                                                    |                                                                                             | Client: Sligo County Council |              |              | BOREHOLE NO: BH11                                                                                                                                                                                        |                      |
| Project Title: Environmental Assessment |                                                                                    |                                                                                             | Site Location: Finisklin     |              |              |                                                                                                                                                                                                          |                      |
| SUBSURFACE CONDITIONS                   |                                                                                    |                                                                                             |                              |              |              | SAMPLE                                                                                                                                                                                                   |                      |
| Depth (mbgl)                            | SYMBOL                                                                             | DESCRIPTION                                                                                 | COMMENTS                     | WATER (mbgl) | Depth (mbgl) | PID (ppm)                                                                                                                                                                                                | INSTALLATION DETAILS |
| 0                                       |  | MADEGROUND.<br>Soft brown/ black silty SAND with some gravel. Gravel is rounded to angular. | 0-0.5mbgl - Organic debris.  |              |              |                                                                                                                                                                                                          |                      |
|                                         |                                                                                    | MADEGROUND.<br>Brown gravelly CLAY.                                                         |                              |              |              |                                                                                                                                                                                                          |                      |
| 1                                       |                                                                                    | MADEGROUND.<br>Dark brown black silty CLAY matrix with rare waste material (<10%). Wet      |                              |              |              |                                                                                                                                                                                                          |                      |
| 2                                       |                                                                                    |                                                                                             |                              |              |              |                                                                                                                                                                                                          |                      |
| 3                                       |                                                                                    | End of hole - 3.0mbgl.                                                                      | 3.0 mbgl: Refusal.           |              |              |                                                                                                                                                                                                          |                      |
| 4                                       |                                                                                    |                                                                                             |                              |              |              |                                                                                                                                                                                                          |                      |
| 5                                       |                                                                                    |                                                                                             |                              |              |              |                                                                                                                                                                                                          |                      |

|                                                                                  |                                                                                                  |                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drill Date: 19-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling | Reference Datum: maOD<br>Elevation: 5.44 maOD toc<br>Easting: 167655.292<br>Northing: 336997.362 | Water Strike: NA<br>Strike:  Level: <br>Revision: Final Page: 1 of 1 |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                                  |                                                                                                                                                                                                                                                |

BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH13

SUBSURFACE CONDITIONS

Depth (mbgl)

SYMBOL

DESCRIPTION

COMMENTS

WATER (mbgl)

Depth (mbgl)

PID (ppm)

INSTALLATION DETAILS

0

MADEGROUND.  
Grey slightly gravelly silty SAND with some cobbles. Gravel is of limestone and shells. Cobbles are of limestone. Damp.

0.6-1.0mbgl: Some orange flecks and dark black/ brown mottling.

1

MADEGROUND.  
Stiff to firm brown slightly gravelly slightly sandy SILT with some cobbles. Gravel and cobbles are of limestone. Occasional gravel of concrete. Damp.

1.0-2.0mbgl: Occasional flecks. Some black mottling. Some organic detritus.

2

MADEGROUND (Waste).  
Black waste.

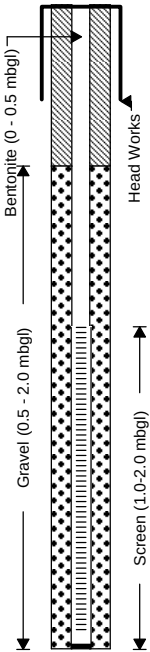
2.1mbgl: Refusal.

3

4

5

End of hole - 2.1 mbgl.



Drill Date: 19-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Reference Datum: maOD

Elevation: 5.07 maOD toc

Easting: 167828.399

Northing: 336901.592

Water Strike: NA

Strike:  Level: 

Revision: Final

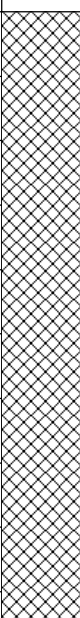
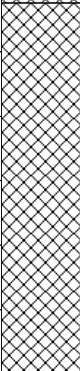
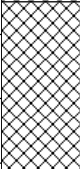
Page: 1 of 1

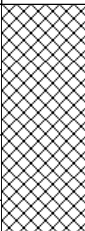
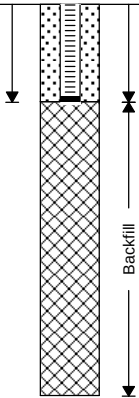
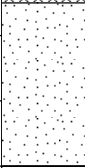
Logged By: CC/ GOD

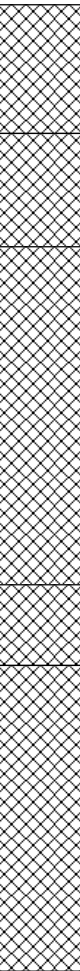
Checked By: EB

DISCLAIMER: This log is for environmental purposes only.



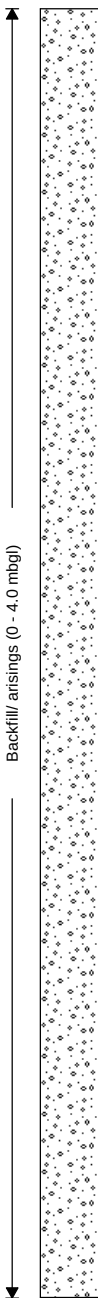
| <h1>BOREHOLE LOG</h1>                                                            |                                                                                     |                                                                                                                                |                                                                                                                                                                         |                                                                                                                                              |              |  <div> 2B Richview Office Park,<br/> Clonskeagh,<br/> Dublin 14 </div>                                                       |                      |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Project Number: EO715                                                            |                                                                                     |                                                                                                                                | Client: Sligo County Council                                                                                                                                            |                                                                                                                                              |              | BOREHOLE NO: BH14                                                                                                                                                                                              |                      |
| Project Title: Environmental Assessment                                          |                                                                                     |                                                                                                                                | Site Location: Finisklin                                                                                                                                                |                                                                                                                                              |              |                                                                                                                                                                                                                |                      |
| SUBSURFACE CONDITIONS                                                            |                                                                                     |                                                                                                                                |                                                                                                                                                                         |                                                                                                                                              |              | SAMPLE                                                                                                                                                                                                         |                      |
| Depth (mbgl)                                                                     | SYMBOL                                                                              | DESCRIPTION                                                                                                                    | COMMENTS                                                                                                                                                                | WATER (mbgl)                                                                                                                                 | Depth (mbgl) | PID (ppm)                                                                                                                                                                                                      | INSTALLATION DETAILS |
| 0                                                                                |   | MADEGROUND.<br>Firm brown slightly sandy slightly gravelly CLAY with rare cobbles. Cobbles are of limestone and granite. Damp. | 0 - 1.9 mbgl: Gravel of limestone, brick and wood. Some orange flecks and black staining.                                                                               |                                                                                                                                              |              |                                                                                                                                                                                                                |                      |
| 1                                                                                |                                                                                     |                                                                                                                                |                                                                                                                                                                         |                                                                                                                                              |              |                                                                                                                                                                                                                |                      |
| 2                                                                                |                                                                                     | MADEGROUND.<br>Firm brown CLAY with some slightly sandy clay matrix.                                                           | 1.9 - 2.45 mbgl: Timber and some organic detritus.                                                                                                                      |                                                                                                                                              |              |                                                                                                                                                                                                                |                      |
| 3                                                                                |                                                                                     |                                             | MADEGROUND.<br>Stiff grey/ brown slightly sandy slightly gravelly CLAY/ SILT with some cobbles. Damp.                                                                   | 2.45 mbgl: C&D Waste.<br>2.45 - 3.6 mbgl: Gravel and cobbles of concrete and brick. Some timber.<br>2.6-2.85 mbgl: Pockets of ashy material. |              |                                                                                                                                                                                                                |                      |
| 4                                                                                |                                                                                     |                                                                                                                                | MADEGROUND.<br>Loose grey/ black SAND and GRAVEL. Wet.                                                                                                                  | 3.6 - 4.5 mbgl: Some pockets of ashy material. Some brick and timber.                                                                        |              |                                                                                                                                                                                                                |                      |
| 5                                                                                |  | MADEGROUND.<br>Soft grey/ brown slightly gravelly sandy SILT with occasional cobbles. Wet.                                     | 4.5 - 5.7 mbgl: Gravel and cobbles of limestone, granite, brick and some shell and ceramic. Occasional lenses of black staining. Occasional yellow and orange mottling. |                                                                                                                                              |              |                                                                                                                                                                                                                |                      |
| Drill Date: 18-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling |                                                                                     |                                                                                                                                | Reference Datum: maOD<br>Elevation: 5.68 maOD toc<br>Easting: 168051.160<br>Northing: 336913.032                                                                        |                                                                                                                                              |              | Water Strike: NA<br>Strike:  Level:  |                      |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                     |                                                                                                                                |                                                                                                                                                                         |                                                                                                                                              |              | Revision: Final Page: 1 of 2                                                                                                                                                                                   |                      |

|                                                                                  |                                                                                   |                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------|
| <h1>BOREHOLE LOG</h1>                                                            |                                                                                   |                                                   |                                                                                                  |                 |                 | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div><div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div></div> |                                                                                     |                      |
| Project Number: EO715                                                            |                                                                                   |                                                   | Client: Sligo County Council                                                                     |                 |                 | BOREHOLE NO: BH14                                                                                                                                                                                                       |                                                                                     |                      |
| Project Title: Environmental Assessment                                          |                                                                                   |                                                   | Site Location: Finisklin                                                                         |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
| SUBSURFACE CONDITIONS                                                            |                                                                                   |                                                   |                                                                                                  |                 |                 | SAMPLE                                                                                                                                                                                                                  |                                                                                     | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                                  | SYMBOL                                                                            | DESCRIPTION                                       | COMMENTS                                                                                         | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                                                                            |                                                                                     |                      |
|                                                                                  |  |                                                   | 5.6 mbgl: Hydrocarbon sheen.                                                                     |                 | 5.6             | 1.7                                                                                                                                                                                                                     |  |                      |
| 6                                                                                |  | Grey silty SAND interbedded with sandy SILT. Wet. |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
|                                                                                  | End of hole - 6.2 mbgl.                                                           |                                                   | 6.2 mbgl: Refusal.                                                                               |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
| 7                                                                                |                                                                                   |                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
| 8                                                                                |                                                                                   |                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
| 9                                                                                |                                                                                   |                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
| 10                                                                               |                                                                                   |                                                   |                                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                                                     |                      |
| Drill Date: 18-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling |                                                                                   |                                                   | Reference Datum: maOD<br>Elevation: 5.68 maOD toc<br>Easting: 168051.160<br>Northing: 336913.032 |                 |                 | Water Strike: NA<br>Strike:  Level:           |                                                                                     |                      |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                   |                                                   |                                                                                                  |                 |                 | Revision: Final      Page: 2 of 2                                                                                                                                                                                       |                                                                                     |                      |

| BOREHOLE LOG                            |                                                                                    |                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> |                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Project Number: EO715                   |                                                                                    |                                                                                                                                                                | Client: Sligo County Council                                                                                                                                                                                                                                                                                                                                                              |              |              | BOREHOLE NO: BH15                                                                                                                                    |                                                      |
| Project Title: Environmental Assessment |                                                                                    |                                                                                                                                                                | Site Location: Finisklin                                                                                                                                                                                                                                                                                                                                                                  |              |              |                                                                                                                                                      |                                                      |
| SUBSURFACE CONDITIONS                   |                                                                                    |                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                           |              |              | SAMPLE                                                                                                                                               |                                                      |
| Depth (mbgl)                            | SYMBOL                                                                             | DESCRIPTION                                                                                                                                                    | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                  | WATER (mbgl) | Depth (mbgl) | PID (ppm)                                                                                                                                            | INSTALLATION DETAILS                                 |
| 0                                       |  | MADEGROUND.<br>Hardcore. Very gravelly SAND with some cobbles. Cobbles are angular to sub-angular of limestone. Dry.                                           | 0.4 - 0.75 mbgl: Gravel of limestone, brick and clinker.<br><br>0.55 - 0.75 mbgl: Lense of ash and clinker.<br><br>0.75 - 1.8 mbgl: Gravel and cobbles of brick and concrete. Black staining/mottling.<br><br>1.8 - 2.05 mbgl: Gravel and cobbles of ceramic, brick and limestone.<br><br>3.00 mbgl: Slight sheen. Possible hydrocarbon stringers on leachate.<br><br>3.00 mbgl: Refusal. |              | 2.9          | 1.6                                                                                                                                                  | <div>↑</div> <div>NO INSTALLATION</div> <div>↓</div> |
|                                         |                                                                                    | MADEGROUND.<br>Soft brown/ grey slightly sandy SILT with occasional gravel. Gravel is angular to subangular of limestone. Dry.                                 |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                                                                                                                                                      |                                                      |
|                                         |                                                                                    | MADEGROUND.<br>Soft grey/ black slightly sandy slightly gravelly SILT with rare cobbles. Gravel and cobbles are of limestone, brick and concrete. Dry to damp. |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                                                                                                                                                      |                                                      |
|                                         |                                                                                    | MADEGROUND.<br>Soft brown slightly sandy gravelly CLAY/ SILT with some cobbles. Gravel and cobbles of ceramic, brick and limestone. Damp.                      |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                                                                                                                                                      |                                                      |
|                                         |                                                                                    | MADEGROUND.<br>Black waste with much timber and plastic and rare silt matrix. Moist.                                                                           |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                                                                                                                                                      |                                                      |
| 3                                       |                                                                                    | End of hole 3.0 mbgl.                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                           |              | 3.0          | 0.5                                                                                                                                                  |                                                      |
| 4                                       |                                                                                    |                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                                                                                                                                                      |                                                      |
| 5                                       |                                                                                    |                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                                                                                                                                                      |                                                      |

|                                                                                  |                                                                                                         |                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drill Date: 18-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling | Reference Datum: maOD<br>Elevation: 3.36maodgl - maodtoc<br>Easting: 167777.703<br>Northing: 337267.824 | Water Strike: NA<br>Strike:  Level:  |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                                         | Revision: Final Page: 1 of 1                                                                                                                                                                                   |

|                                                                                  |                         |                                                                  |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
|----------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------|
| <div>BOREHOLE LOG</div>                                                          |                         |                                                                  |                                                                                                        |                 |                    | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |                                                      |                      |
| Project Number: EO715                                                            |                         |                                                                  | Client: Sligo County Council                                                                           |                 |                    | BOREHOLE NO: BH16                                                                                                                                                    |                                                      |                      |
| Project Title: Environmental Assessment                                          |                         |                                                                  | Site Location: Finisklin                                                                               |                 |                    |                                                                                                                                                                      |                                                      |                      |
| SUBSURFACE CONDITIONS                                                            |                         |                                                                  |                                                                                                        |                 |                    | SAMPLE                                                                                                                                                               |                                                      | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                                  | SYMBOL                  | DESCRIPTION                                                      | COMMENTS                                                                                               | WATER<br>(mbgl) | Depth<br>(mbgl)    | PID<br>(ppm)                                                                                                                                                         |                                                      |                      |
| 0                                                                                |                         | MADEGROUND.<br>Firm brown gravelly SILT/ CLAY with some cobbles. |                                                                                                        |                 | 0.4                | 0.1                                                                                                                                                                  | <div>↑</div> <div>NO INSTALLATION</div> <div>↓</div> |                      |
| 1                                                                                |                         | MADEGROUND.<br>Soft brown sandy gravelly SILT/ CLAY.             |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
|                                                                                  |                         | MADEGROUND.<br>GRAVEL with boulders. Moist.                      |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
|                                                                                  |                         | MADEGROUND.<br>Gravelly SILT/ CLAY.                              |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
|                                                                                  |                         | MADEGROUND.<br>Brown silty sandy GRAVEL.                         |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
| 2                                                                                |                         |                                                                  | 1.6 - 2.4 mbgl: No recovery.                                                                           |                 | 2.4                | 0                                                                                                                                                                    |                                                      |                      |
|                                                                                  |                         |                                                                  | 2.60-3.00 mbgl: Plastic fabric and teram.                                                              |                 |                    |                                                                                                                                                                      |                                                      |                      |
|                                                                                  |                         | MADEGROUND.<br>Grey SAND.                                        |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
| 3                                                                                |                         | GRAVEL.                                                          |                                                                                                        |                 | 3.4                | 0                                                                                                                                                                    |                                                      |                      |
|                                                                                  |                         | Grey SAND.                                                       |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
| 4                                                                                | End of hole - 4.0 mbgl. |                                                                  |                                                                                                        |                 | 4.0 mbgl: Refusal. |                                                                                                                                                                      |                                                      |                      |
| 5                                                                                |                         |                                                                  |                                                                                                        |                 |                    |                                                                                                                                                                      |                                                      |                      |
| Drill Date: 17-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling |                         |                                                                  | Reference Datum: maOD<br>Elevation: 2.25maodgl - maodtoc<br>Easting: 167946.699<br>Northing: 337106.66 |                 |                    | Water Strike: NA<br>Strike:  Level:                                                                                                                                  |                                                      |                      |
| Logged By: CC<br>Checked By: EB                                                  |                         |                                                                  |                                                                                                        |                 |                    | Revision: Final      Page: 1 of 1                                                                                                                                    |                                                      |                      |

| BOREHOLE LOG                                                                     |                                                                                     |                                                                 |                                                                                                         |                                                                                                           |                                                                                                                                                                                                                      | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> <div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div> |                                                                                      |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Project Number: EO715                                                            |                                                                                     |                                                                 | Client: Sligo County Council                                                                            |                                                                                                           |                                                                                                                                                                                                                      | BOREHOLE NO: BH17                                                                                                                                                                                                        |                                                                                      |
| Project Title: Environmental Assessment                                          |                                                                                     |                                                                 | Site Location: Finisklin                                                                                |                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                      |
| SUBSURFACE CONDITIONS                                                            |                                                                                     |                                                                 |                                                                                                         |                                                                                                           | SAMPLE                                                                                                                                                                                                               |                                                                                                                                                                                                                          | INSTALLATION DETAILS                                                                 |
| Depth<br>(mbgl)                                                                  | SYMBOL                                                                              | DESCRIPTION                                                     | COMMENTS                                                                                                | WATER<br>(mbgl)                                                                                           | Depth<br>(mbgl)                                                                                                                                                                                                      | PID<br>(ppm)                                                                                                                                                                                                             |                                                                                      |
| 0                                                                                |    | MADEGROUND (Hardcore).                                          | 0.60-0.85mbgl: Plastic, wrappers, chip board.                                                           |  1.2mbgl: Water Strike |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |  |
|                                                                                  |                                                                                     | MADEGROUND.<br>Silty CLAY with some cobbles.                    |                                                                                                         |                                                                                                           | 0.55                                                                                                                                                                                                                 | 0.4                                                                                                                                                                                                                      |                                                                                      |
|                                                                                  |                                                                                     | MADEGROUND (Waste).<br>Waste with some black sand.              |                                                                                                         |                                                                                                           | 0.75                                                                                                                                                                                                                 | 0                                                                                                                                                                                                                        |                                                                                      |
| 1                                                                                |                                                                                     | MADEGROUND (Waste).<br>Waste with CLAY matrix and some cobbles. |                                                                                                         |                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                      |
|                                                                                  |  | MADEGROUND (Waste).<br>Waste with SAND.                         | 1.0 - 1.5 mbgl: No recovery.                                                                            |                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                      |
| 2                                                                                |                                                                                     | MADEGROUND (Waste).<br>Waste with grey SAND.                    |                                                                                                         | 2.35                                                                                                      | 2.4                                                                                                                                                                                                                  |                                                                                                                                                                                                                          |                                                                                      |
|                                                                                  |  | MADEGROUND.<br>Dark grey SAND.                                  | 3.00-3.30mbgl: Glass fragments. H2S odour.                                                              |                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                      |
| 3                                                                                |                                                                                     | Fine grey silty SAND.                                           |                                                                                                         | 3.75                                                                                                      | 0                                                                                                                                                                                                                    |                                                                                                                                                                                                                          |                                                                                      |
| 4                                                                                | End of hole - 4.0mbgl.                                                              |                                                                 | 4.0 mbgl: Refusal.                                                                                      |                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                      |
| 5                                                                                |                                                                                     |                                                                 |                                                                                                         |                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                      |
| Drill Date: 17-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling |                                                                                     |                                                                 | Reference Datum: maOD<br>Elevation: 2.76maodgl - maodtoc<br>Easting: 167975.043<br>Northing: 337023.631 |                                                                                                           | Water Strike: 1.2 mbgl<br>Strike:  Level:  |                                                                                                                                                                                                                          |                                                                                      |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                     |                                                                 |                                                                                                         |                                                                                                           | Revision: Final      Page: 1 of 1                                                                                                                                                                                    |                                                                                                                                                                                                                          |                                                                                      |



BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

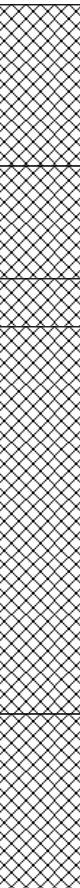
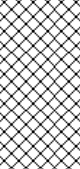
Project Number: EO715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH18

| SUBSURFACE CONDITIONS |                                                                                     |                                                                                                           |                                                                                                    |              | SAMPLE       |           | INSTALLATION DETAILS                                 |
|-----------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------|--------------|-----------|------------------------------------------------------|
| Depth (mbgl)          | SYMBOL                                                                              | DESCRIPTION                                                                                               | COMMENTS                                                                                           | WATER (mbgl) | Depth (mbgl) | PID (ppm) |                                                      |
| 0                     |   | MADEGROUND.<br>Soft brown/ grey slightly gravelly sandy SILT. Gravel is of limestone. Damp.               | 0.0-0.5 mbgl: Some brick and timber.<br>Occasional black mottling. Some orange oxidation staining. |              | 1.15         | 0         | <div>↑</div> <div>NO INSTALLATION</div> <div>↓</div> |
|                       |                                                                                     | MADEGROUND.<br>Loose black/ grey sandy GRAVEL of limestone, brick and concrete. Damp.                     | 0.55 - 0.70 mbgl: Ashy material.                                                                   |              |              |           |                                                      |
|                       |                                                                                     | MADEGROUND.<br>Soft brown slightly gravelly sandy SILT. Gravel is of brick, shells and limestone.         | 0.7 - 0.9 mbgl: Brick and gravel.<br>0.85-1.0 mbgl: Some white mottling.                           |              |              |           |                                                      |
| 1                     |                                                                                     | MADEGROUND.<br>Wood, concrete and brick with some loose black slightly clayey silty SAND and GRAVEL. Wet. | 1.0-2.2 mbgl: Some wood, concrete and brick. Black staining.                                       |              |              |           |                                                      |
|                       |                                                                                     |                                                                                                           | 1.0 - 2.20 mbgl: Low recovery (50%).                                                               |              |              |           |                                                      |
| 2                     |  | MADEGROUND.<br>Soft black sandy SILT with some gravel of limestone, brick and ceramic. Wet.               | 2.2 - 2.75 mbgl: Black staining.                                                                   |              | 2.5          | 0.3       |                                                      |
|                       |                                                                                     |                                                                                                           | 2.5 mbgl: Sheen/iridesence.                                                                        |              |              |           |                                                      |
| 3                     |  | Soft grey/ black sandy SILT with lenses of fine to medium sand and occasional shells.                     | 2.75 - 4.0 mbgl: Sand lenses 5 - 10 cm thick.                                                      |              | 3.0          | 0         |                                                      |
|                       |                                                                                     |                                                                                                           |                                                                                                    |              |              |           |                                                      |
| 4                     |                                                                                     | End of hole - 4.0 mbgl.                                                                                   | 4.0 mbgl: Refusal.                                                                                 |              |              |           |                                                      |
| 5                     |                                                                                     |                                                                                                           |                                                                                                    |              |              |           |                                                      |

Drill Date: 17-06-2009

Drill Method: Dynamic Probe

Drilled By: JS Drilling

Reference Datum: maOD

Elevation: 3.03maodgl - maodtoc

Easting: 168068.851

Northing: 336935.719

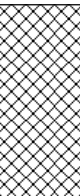
Water Strike: NA

Strike:  Level: 

Revision: Final Page: 1 of 1

Logged By: CC

Checked By: CC

|                                                                                  |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
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| <h1>BOREHOLE LOG</h1>                                                            |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div><div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div></div> |                                                      |                      |
| Project Number: EO715                                                            |                                                                                   |                                                                                                                      | Client: Sligo County Council                                                                              |                 |                 | BOREHOLE NO: BH19                                                                                                                                                                                                       |                                                      |                      |
| Project Title: Environmental Assessment                                          |                                                                                   |                                                                                                                      | Site Location: Finisklin                                                                                  |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
| SUBSURFACE CONDITIONS                                                            |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 | SAMPLE                                                                                                                                                                                                                  |                                                      | INSTALLATION DETAILS |
| Depth<br>(mbgl)                                                                  | SYMBOL                                                                            | DESCRIPTION                                                                                                          | COMMENTS                                                                                                  | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm)                                                                                                                                                                                                            |                                                      |                      |
| 0                                                                                |  | MADEGROUND.<br>Soft brown slightly sandy gravelly CLAY.<br>Gravel of limestone and brick. Damp.                      |                                                                                                           |                 |                 |                                                                                                                                                                                                                         | <div>↑</div> <div>NO INSTALLATION</div> <div>↓</div> |                      |
|                                                                                  |                                                                                   | MADEGROUND.<br>Firm brown/ black slightly sandy gravelly CLAY. Gravel of limestone, brick, timber and glass. Damp.   | 0.6 - 1.55 mbgl: Some black staining.<br><br>0.8 - 0.85 mbgl: Ashy material.                              |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
| 1                                                                                |                                                                                   | MADEGROUND.<br>Soft black slightly gravelly sandy organic CLAY/ SILT. Gravel of limestone, glass and ceramic. Moist. | 1.55 - 3.2 mbgl: Some plastic, glass, paper and ceramic. Some lenses of black/ grey ashy sand and gravel. |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
| 2                                                                                |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
| 3                                                                                |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
| 4                                                                                |                                                                                   | End of hole - 4.0 mbgl.                                                                                              | 4.0 mbgl: Refusal.                                                                                        | 3.5mbgl: Strike | 3.2             | 0.5                                                                                                                                                                                                                     |                                                      |                      |
| 5                                                                                |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 |                                                                                                                                                                                                                         |                                                      |                      |
| Drill Date: 18-06-2009<br>Drill Method: Dynamic Probe<br>Drilled By: JS Drilling |                                                                                   |                                                                                                                      | Reference Datum: maOD<br>Elevation: 4.41maodgl - maodtoc<br>Easting: 168020.652<br>Northing: 336831.199   |                 |                 | Water Strike: 3.5 mbgl<br>Strike:  Level:     |                                                      |                      |
| Logged By: CC<br>Checked By: EB                                                  |                                                                                   |                                                                                                                      |                                                                                                           |                 |                 | Revision: Final Page: 1 of 1                                                                                                                                                                                            |                                                      |                      |



**MALONE O'REGAN**  
ENVIRONMENTAL SERVICES LTD

**DISCLAIMER:** This log is for environmental purposes only.

**MOR**  
MALONE O'REGAN  
ENVIRONMENTAL SERVICES Ltd.

2B Richview Office Park,  
Clonskeagh,  
Dublin 14

**Client:** Sligo County Council

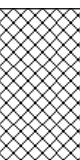
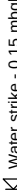
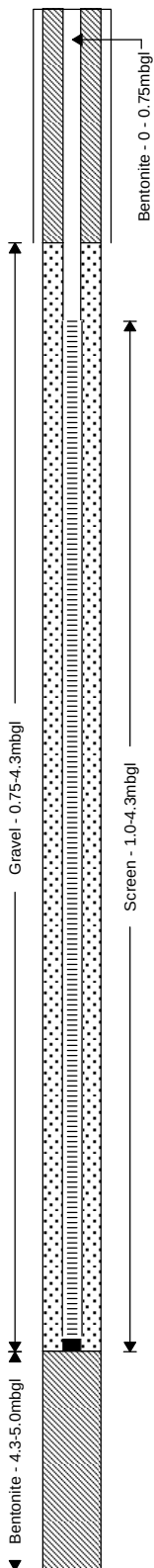
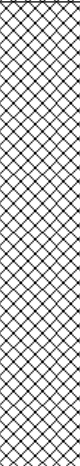
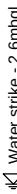
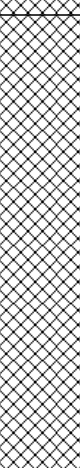
**Site Location:** Finisklin

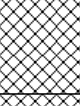
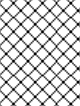
**BOREHOLE NO: BH21**

|                                                                                                                                  |                                                                                           |                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Drill Date:</b> 23/02/2010 & 24/02/2010<br><b>Drill Method:</b> Shell and auger<br><b>Drilled By:</b> Geotech Specialists Ltd | <b>Reference Datum:</b><br><b>Elevation:</b> 0<br><b>Easting:</b> 0<br><b>Northing:</b> 0 | <b>Water Strike:</b> 3.6mbgl<br><b>Strike:</b>  <b>Level:</b>  |
| <b>Logged By:</b> SJ<br><b>Checked By:</b> EB                                                                                    |                                                                                           | <b>Revision:</b> Final <b>Page:</b> 1 of 1                                                                                                                                                                                           |

| BOREHOLE LOG                                                                                   |        |                                                                                                                       |                                                                      |                         |                                                              | <div><div><div></div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |                                                                                                                                         |
|------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Project Number: E0715                                                                          |        |                                                                                                                       | Client: Sligo County Council                                         |                         |                                                              | BOREHOLE NO: BH22                                                                                                                                                 |                                                                                                                                         |
| Project Title: Environmental Assessment                                                        |        |                                                                                                                       | Site Location: Finisklin                                             |                         |                                                              |                                                                                                                                                                   |                                                                                                                                         |
| SUBSURFACE CONDITIONS                                                                          |        |                                                                                                                       |                                                                      |                         | SAMPLE                                                       |                                                                                                                                                                   | INSTALLATION DETAILS                                                                                                                    |
| Depth (mbgl)                                                                                   | SYMBOL | DESCRIPTION                                                                                                           | COMMENTS                                                             | WATER (mbgl)            | Depth (mbgl)                                                 | PID (ppm)                                                                                                                                                         |                                                                                                                                         |
| 0                                                                                              |        | MADEGROUND. Topsoil.                                                                                                  | 0.15-0.4mbgl: Traces of red brick and metal.                         | Water strike - 0.8mbgl. |                                                              |                                                                                                                                                                   | <div>Bentonite - 0-0.75mbgl</div> <div>Gravel - 0.75-3.8mbgl</div> <div>Screen - 0.92-3.80mbgl</div> <div>Bentonite - 3.8-4.5mbgl</div> |
|                                                                                                |        | MADEGROUND. Red sandy gravelly CLAY with cobbles. Gravel and cobbles medium subrounded of various lithologies. Moist. |                                                                      |                         | 0.4-0.8mbgl: Some red bricks.<br>0.45mbgl: One glass bottle. | 0.4                                                                                                                                                               |                                                                                                                                         |
|                                                                                                |        | MADEGROUND. Grey coarse SAND and GRAVEL. Gravel subangular of various lithologies with some brick. Dry.               | 0.8-3.9mbgl: Occasional metal, plastic, wood and glass. Waste odour. |                         |                                                              |                                                                                                                                                                   |                                                                                                                                         |
| 1                                                                                              |        | MADEGROUND. Dark grey coarse angular GRAVEL and COBBLES of various lithologies. Saturated.                            | 1.0-2.0mbgl: Oily sheen and odour.                                   |                         | 1.0                                                          | 2.0                                                                                                                                                               |                                                                                                                                         |
| 2                                                                                              |        |                                                                                                                       |                                                                      |                         | 2.0                                                          | 1.2                                                                                                                                                               |                                                                                                                                         |
| 3                                                                                              |        |                                                                                                                       |                                                                      |                         | 3.0                                                          | 3.3                                                                                                                                                               |                                                                                                                                         |
| 4                                                                                              |        | Grey fine SAND. Saturated.                                                                                            | 3.9-4.5mbgl: Some sea shells. No evidence of contamination.          |                         | 3.9                                                          | 0.0                                                                                                                                                               |                                                                                                                                         |
|                                                                                                |        | End of hole - 4.5mbgl.                                                                                                | 4.5 mbgl: Refusal.                                                   |                         |                                                              |                                                                                                                                                                   |                                                                                                                                         |
| 5                                                                                              |        |                                                                                                                       |                                                                      |                         |                                                              |                                                                                                                                                                   |                                                                                                                                         |
| Drill Date: 24/02/2010<br>Drill Method: Shell and auger<br>Drilled By: Geotech Specialists Ltd |        |                                                                                                                       | Reference Datum:<br>Elevation: 0<br>Easting: 0<br>Northing: 0        |                         | Water Strike: 0.8mbgl.<br>Strike:  Level:                    |                                                                                                                                                                   |                                                                                                                                         |
| Logged By: SJ<br>Checked By: EB                                                                |        |                                                                                                                       |                                                                      |                         | Revision: Final      Page: 1 of 1                            |                                                                                                                                                                   |                                                                                                                                         |



| BOREHOLE LOG                                                                                   |                                                                                     |                                                                                                                                                           |                                                                                                                          |                                                                                                              |                                                                                                                                                                                                                                | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> <div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div> |                                                                                      |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Project Number: E0715                                                                          |                                                                                     |                                                                                                                                                           | Client: Sligo County Council                                                                                             |                                                                                                              |                                                                                                                                                                                                                                | BOREHOLE NO: BH23                                                                                                                                                                                                        |                                                                                      |
| Project Title: Environmental Assessment                                                        |                                                                                     |                                                                                                                                                           | Site Location: Finisklin                                                                                                 |                                                                                                              |                                                                                                                                                                                                                                |                                                                                                                                                                                                                          |                                                                                      |
| SUBSURFACE CONDITIONS                                                                          |                                                                                     |                                                                                                                                                           |                                                                                                                          |                                                                                                              | SAMPLE                                                                                                                                                                                                                         |                                                                                                                                                                                                                          | INSTALLATION DETAILS                                                                 |
| Depth (mbgl)                                                                                   | SYMBOL                                                                              | DESCRIPTION                                                                                                                                               | COMMENTS                                                                                                                 | WATER (mbgl)                                                                                                 | Depth (mbgl)                                                                                                                                                                                                                   | PID (ppm)                                                                                                                                                                                                                |                                                                                      |
| 0                                                                                              |    | MADEGROUND.<br>Grey brown coarse angular GRAVEL and COBBLES of grey limestone. Saturated.                                                                 | 0-0.6mbgl: Trace of wood. No odour. No evidence of contamination.                                                        |  Water strike - 0.15 mbgl |                                                                                                                                                                                                                                |                                                                                                                                                                                                                          |  |
|                                                                                                |                                                                                     | MADEGROUND (Waste).                                                                                                                                       | 0.6-2.0mbgl: Plastic bags, ceramic red bricks, glass and metal. Slight waste odour.                                      |                                                                                                              |                                                                                                                                                                                                                                |                                                                                                                                                                                                                          |                                                                                      |
| 1                                                                                              |   |                                                                                                                                                           | 1.0-2.0mbgl: Low recovery. Slight oily sheen.                                                                            |  Water strike - 2.6mbgl | 1.0                                                                                                                                                                                                                            | 0.0                                                                                                                                                                                                                      |                                                                                      |
| 2                                                                                              |                                                                                     | MADEGROUND.<br>Dark grey/ brown sandy gravelly SILT with cobbles. Sand is fine. Gravel coarse subangular of various lithologies with some brick. Damp.    | 2.0mbgl: Layer of thin white plastic wrapping.<br>2.0-2.6mbgl: Some red bricks and traces of metal. Decomposition odour. |                                                                                                              | 2.0                                                                                                                                                                                                                            | 1.7                                                                                                                                                                                                                      |                                                                                      |
|                                                                                                |                                                                                     | MADEGROUND.<br>GRAVEL and COBBLES. Gravel and cobbles dark grey/black angular of various lithologies with much glass, some brick and concrete. Saturated. | 2.6-4.4mbgl: Occasional plastic, metal and wood. Decomposition odour.                                                    |                                                                                                              | 2.5<br>2.6                                                                                                                                                                                                                     | 0.5<br>0.2                                                                                                                                                                                                               |                                                                                      |
| 3                                                                                              |  |                                                                                                                                                           | 3.0mbgl: One cleaning brush.                                                                                             |  Water strike - 2.6mbgl | 3.0                                                                                                                                                                                                                            | 0.0                                                                                                                                                                                                                      |                                                                                      |
|                                                                                                |                                                                                     |                                                                                                                                                           | 3.5-4.0mbgl: Some plastic sheeting.                                                                                      |                                                                                                              | 3.5-4.0                                                                                                                                                                                                                        | 0.0                                                                                                                                                                                                                      |                                                                                      |
| 4                                                                                              |                                                                                     |                                                                                                                                                           |                                                                                                                          |                                                                                                              |                                                                                                                                                                                                                                |                                                                                                                                                                                                                          |                                                                                      |
|                                                                                                |  | Grey sandy SILT. Saturated.                                                                                                                               | 4.4-5.0: No evidence of contamination. No odour.                                                                         |                                                                                                              |                                                                                                                                                                                                                                |                                                                                                                                                                                                                          |                                                                                      |
| 5                                                                                              |                                                                                     | End of hole - 5.0mbgl.                                                                                                                                    | 5.0 mbgl: Refusal.                                                                                                       |                                                                                                              |                                                                                                                                                                                                                                |                                                                                                                                                                                                                          |                                                                                      |
| Drill Date: 24/02/2010<br>Drill Method: Shell and auger<br>Drilled By: Geotech Specialists Ltd |                                                                                     |                                                                                                                                                           | Reference Datum:<br>Elevation: 0<br>Easting: 0<br>Northing: 0                                                            |                                                                                                              | Water Strike: 0.15mbgl & 2.6mbgl<br>Strike:  Level:  |                                                                                                                                                                                                                          |                                                                                      |
| Logged By: SJ<br>Checked By: EB                                                                |                                                                                     |                                                                                                                                                           |                                                                                                                          |                                                                                                              | Revision: Final      Page: 1 of 1                                                                                                                                                                                              |                                                                                                                                                                                                                          |                                                                                      |

| BOREHOLE LOG                                                                                 |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> <div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div> |                      |                                                                                       |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------|
| Project Number: E0715                                                                        |                                                                                     |                                                                                                                                                                                                    | Client: Sligo County Council                                                                                          |              |              | BOREHOLE NO: BH24                                                                                                                                                                                                        |                      |                                                                                       |
| Project Title: Environmental Assessment                                                      |                                                                                     |                                                                                                                                                                                                    | Site Location: Finisklin                                                                                              |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| SUBSURFACE CONDITIONS                                                                        |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              | SAMPLE       |                                                                                                                                                                                                                          | INSTALLATION DETAILS |                                                                                       |
| Depth (mbgl)                                                                                 | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                                        | COMMENTS                                                                                                              | WATER (mbgl) | Depth (mbgl) | PID (ppm)                                                                                                                                                                                                                |                      |                                                                                       |
| 0                                                                                            |    | MADEGROUND<br>Topsoil.                                                                                                                                                                             | 0.5-0.85mbgl: Waste of black plastic bags, wood, ashy material, red bricks and glass. Occasional lenses of grey sand. |              |              | 0.5                                                                                                                                                                                                                      | 0.3                  |    |
|                                                                                              |    | MADEGROUND<br>Firm red/ brown slightly sandy slightly gravelly CLAY with cobbles. Gravel and cobbles subrounded to subangular of various lithologies. Moist.                                       |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |    | MADEGROUND<br>Soft dark brown and grey sandy gravelly CLAY with cobbles. Gravel and cobbles subrounded to subangular of grey limestone. Occasional sand lenses. Occasional lenses of waste. Moist. |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| 1                                                                                            |    | MADEGROUND<br>Soft to firm red/ brown sandy gravelly CLAY with cobbles. Gravel medium to coarse, subrounded to subangular of grey limestone. Moist.                                                | 0.85-1.7mbgl: No evidence of contamination. No odour.                                                                 |              |              | 0.85                                                                                                                                                                                                                     | 0.1                  |    |
|                                                                                              |   | Grey coarse GRAVEL and COBBLES of grey limestone.                                                                                                                                                  |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| 2                                                                                            |  |                                                                                                                                                                                                    | 1.7-3.5mbgl: No evidence of contamination. No odour.                                                                  |              |              | 2.0                                                                                                                                                                                                                      | 0.0                  |  |
|                                                                                              |  |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |  |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| 3                                                                                            |  |                                                                                                                                                                                                    | 3.5mbgl: Refusal.                                                                                                     |              |              | 3.0                                                                                                                                                                                                                      | 0.0                  |  |
|                                                                                              |  |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |  |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |  | End of hole - 3.5 mbgl.                                                                                                                                                                            |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| 4                                                                                            |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
|                                                                                              |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| 5                                                                                            |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              |                                                                                                                                                                                                                          |                      |                                                                                       |
| Drill Date: 23/02/10<br>Drill Method: Shell and auger<br>Drilled By: Geotech Specialists Ltd |                                                                                     |                                                                                                                                                                                                    | Reference Datum:<br>Elevation: 0<br>Easting: 0<br>Northing: 0                                                         |              |              | Water Strike: 1.70mbgl<br>Strike:  Level:      |                      |                                                                                       |
| Logged By: SJ<br>Checked By: EB                                                              |                                                                                     |                                                                                                                                                                                                    |                                                                                                                       |              |              | Revision: Final      Page: 1 of 1                                                                                                                                                                                        |                      |                                                                                       |

BOREHOLE LOG



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

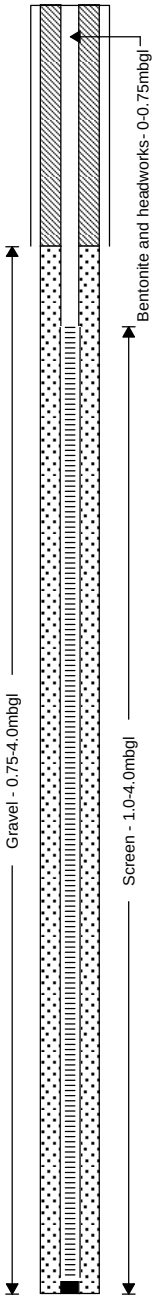
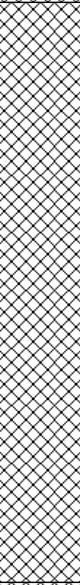
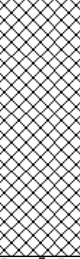
Project Number: E0715

Client: Sligo County Council

Project Title: Environmental Assessment

Site Location: Finisklin

BOREHOLE NO: BH25

| SUBSURFACE CONDITIONS |                                                                                     |                                                                                                                                                       |                         |              | SAMPLE       |           | INSTALLATION DETAILS                                                                 |
|-----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------|--------------|-----------|--------------------------------------------------------------------------------------|
| Depth (mbgl)          | SYMBOL                                                                              | DESCRIPTION                                                                                                                                           | COMMENTS                | WATER (mbgl) | Depth (mbgl) | PID (ppm) |                                                                                      |
| 0                     |    | MADEGROUND. Topsoil.                                                                                                                                  | 0.2-2.0mbgl: Some wood. |              |              |           |  |
|                       |   | MADEGROUND. Soft brown slightly sandy slightly gravelly CLAY with cobbles. Gravel and cobbles subangular of grey limestone, brick and concrete. Damp. |                         |              | 0.5          | 0.8       |                                                                                      |
| 1                     |                                                                                     |                                                                                                                                                       |                         |              | 1.5          | 1.3       |                                                                                      |
| 2                     |  | MADEGROUND. Soft grey blue sandy gravelly CLAY. Gravel of various lithologies. Damp.                                                                  | 2.5                     | 2.3          |              |           |                                                                                      |
| 3                     |  | Grey coarse angular GRAVEL and COBBLES of grey limestone.                                                                                             | 3.5                     | 0.2          |              |           |                                                                                      |
| 4                     | End of hole - 4.0mbgl.                                                              |                                                                                                                                                       | 4.0mbgl: Refusal.       |              |              |           |                                                                                      |
| 5                     |                                                                                     |                                                                                                                                                       |                         |              |              |           |                                                                                      |

Drill Date: 23/02/2010

Drill Method: Shell and auger

Drilled By: Geotech Specialists Ltd

Reference Datum:

Elevation: 0

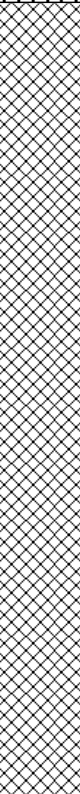
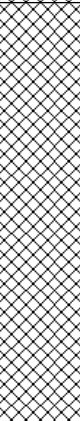
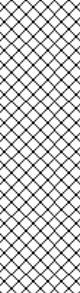
Easting: 0

Northing: 0

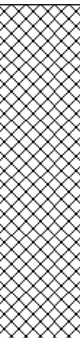
Water Strike: NA

Strike:  Level: 

Revision: Final Page: 1 of 1

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                                                                     |                                                                                                                                |                         |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br>MALONE O'REGAN<br>ENVIRONMENTAL SERVICES LTD. |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     |                                                                                                                                                                                                                                     | Client: Sligo County Council                                                                                                   |                         | TRIAL PIT NO: TP1                                                                                                                                                                        |           |
| Project Title: Environmental Assessment |                                                                                     |                                                                                                                                                                                                                                     | Site Location: Finisklin                                                                                                       |                         |                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                                                                     |                                                                                                                                |                         | SAMPLE                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                                                                         | COMMENTS                                                                                                                       | WATER (mbgl)            | Depth (mbgl)                                                                                                                                                                             | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Firm brown/grey slightly sandy slightly gravelly CLAY with rootlets.                                                                                                                                                 | 0.25 - 2.7 mbgl: Occasional orange mottling. Rare fragments of plastic and timber.                                             |                         | 0.5                                                                                                                                                                                      | 0         |
|                                         |                                                                                     | MADEGROUND (Landfill cap).<br>Firm brown/grey slightly sandy slightly gravelly CLAY/SILT with some cobbles. Gravel and cobbles are subangular to rounded of limestone and rare timber and plastic. Damp.                            |                                                                                                                                |                         |                                                                                                                                                                                          |           |
| 1                                       |   |                                                                                                                                                                                                                                     |                                                                                                                                |                         |                                                                                                                                                                                          |           |
| 2                                       |                                                                                     |                                                                                                                                                                                                                                     |                                                                                                                                |                         |                                                                                                                                                                                          |           |
|                                         |                                                                                     |                                                                                                                                                                                                                                     |                                                                                                                                |                         |                                                                                                                                                                                          |           |
| 3                                       |  | MADEGROUND (Municipal Waste).<br>Mixed waste with black/ brown slightly sandy sludge matrix. Black and white refuse sacks with moderately decomposed organic matter (60%). Some food wrappers, tins, paper, newspaper (31/05/1991). | 2.7 - 4.9 mbgl: Some lenses of ashy material. Slight iridescence on moist material.                                            | 3.2mbgl: Minor seepage. | 2.2                                                                                                                                                                                      | 0         |
|                                         |                                                                                     |                                                                                                                                                                                                                                     | 3.1 mbgl: Black/ white plastic and refuse sacks.<br>3.2 mbgl: Some office stationery (pens, paper etc). Rolls of plastic wrap. |                         |                                                                                                                                                                                          |           |
|                                         |                                                                                     |                                                                                                                                                                                                                                     | 3.4 mbgl: Black plastic wrap (10%), much glass (10%), twine, rare metal and plastic pipe fragments (less than 5%).             |                         |                                                                                                                                                                                          |           |
| 4                                       |  |                                                                                                                                                                                                                                     |                                                                                                                                |                         |                                                                                                                                                                                          |           |
|                                         |                                                                                     |                                                                                                                                                                                                                                     |                                                                                                                                |                         |                                                                                                                                                                                          |           |
|                                         |                                                                                     |                                                                                                                                                                                                                                     |                                                                                                                                |                         |                                                                                                                                                                                          |           |
| 5                                       |                                                                                     | End of trial pit 4.9 mbgl.                                                                                                                                                                                                          | 4.9 mbgl: Sludge/ matrix dry (low tide).                                                                                       |                         |                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: 3.1 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167599.084   |                                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337211.071  | Revision: Final                                                                                                                                                                            |
| Checked By: EB                                  |                       | Page 1 of 1                                                                                                                                                                                |

| TRIAL PIT LOG                           |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                        |                        |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |           |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  | Client: Sligo County Council                                           |                        | TRIAL PIT NO: TP2                                                                                                                                                                                        |           |
| Project Title: Environmental Assessment |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  | Site Location: Finisklin                                               |                        |                                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                        |                        | SAMPLE                                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                                                                                                                                                                                                                                                                                                                              | DESCRIPTION                                                                                                                                                      | COMMENTS                                                               | WATER (mbgl)           | Depth (mbgl)                                                                                                                                                                                             | PID (ppm) |
| 0                                       |                                                                                                                                                                                                                                                                                                    | MADEGROUND (Landfill Cap - C&D). Soft brown/ grey slightly sandy slightly gravelly CLAY/ SILT. Gravel of concrete and limestone. Some lenses of sandy silt. Dry. | 0.0 - 1.6 mbgl: Some concrete slabs. Rare timber and fabric fragments. | 4.7 mbgl: Minor strike | 1.8                                                                                                                                                                                                      | 0         |
| 1                                       |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  | 1.6 - 2.5 mbgl: Some orange and black mottling.                        |                        |                                                                                                                                                                                                          |           |
| 2                                       |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  | 2.0 - 2.5 mbgl: Some plastic pipe and fabric.                          |                        |                                                                                                                                                                                                          |           |
| 3                                       | MADEGROUND. Grey/brown slightly clayey, slightly sandy GRAVEL with occasional cobbles. Gravel is angular of limestone. Cobbles are subrounded to rounded of limestone. Damp.                                                                                                                                                                                                        | 2.5mbgl: Former ground surface.                                                                                                                                  |                                                                        |                        |                                                                                                                                                                                                          |           |
| 4                                       | MADEGROUND (Municipal waste). Mixed waste with black gravelly sand matrix (reworked marine sediments). Waste of black refuse sacks with low to medium decomposed organic waste including sanitary waste, cleaning product containers, food wrappers. Rare C&D waste of brick, concrete slabs. Some tyres and metal. Occasional plastic wraps with peat/ moss/ soil (garden centre). | 3.7 - 4.95 mbgl: Food wrappers, sanitary waste, refuse sacks, tyres and brick.                                                                                   | 4.1                                                                    |                        |                                                                                                                                                                                                          |           |
| 4.6                                     |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                  |                                                                        | 0                      |                                                                                                                                                                                                          |           |
| 5                                       |                                                                                                                                                                                                                                                                                                                                                                                     | End of trial pit - 4.95 mbgl.                                                                                                                                    |                                                                        |                        |                                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: 4.7 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167679.084   | Revision: Final Page 1 of 1                                                                                                                                                                |
| Logged By: CC                                   | Northing: 337227.212  |                                                                                                                                                                                            |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |





2B Richview Office Park,  
Clonskeagh,  
Dublin 14

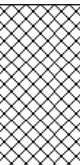
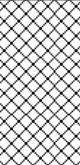
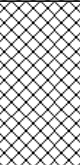
**Client:** Sligo County Council

**Site Location:** Finisklin

TRIAL PIT NO: TP3

## SAMPLE F

|                    |                              |                  |            |               |                                                                                     |
|--------------------|------------------------------|------------------|------------|---------------|-------------------------------------------------------------------------------------|
| Excavation Date:   | 16/06/09                     | Reference Datum: | maOD       | Water Strike: | 2.4 mbgl and 4.3 mbgl                                                               |
| Excavation Method: | Tracked Mechanical Excavator | Elevation:       | NA         | Strike:       |  |
| Excavated By:      | John Donlon Plant Hire       |                  |            | Level:        |  |
| Logged By:         | CC                           | Easting:         | 167518.511 | Revision:     | Final                                                                               |
| Checked By:        | EB                           | Northing:        | 337149.904 |               | Page 1 of 1                                                                         |

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                                   |                                                                 |              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br>MALONE O'REGAN<br>ENVIRONMENTAL SERVICES LTD. |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     | Client: Sligo County Council                                                                                                                                                                      |                                                                 |              | TRIAL PIT NO: TP4                                                                                                                                                                        |           |
| Project Title: Environmental Assessment |                                                                                     | Site Location: Finisklin                                                                                                                                                                          |                                                                 |              |                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                                   |                                                                 |              | SAMPLE                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                                       | COMMENTS                                                        | WATER (mbgl) | Depth (mbgl)                                                                                                                                                                             | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Brown sandy GRAVEL with some lenses of clay. Gravel of brick and limestone. Rare C&D waste. Damp.                                                                                  | 0.0 - 0.5 mbgl: C&D waste of fabric and timber.                 |              | 2.0                                                                                                                                                                                      | 0         |
|                                         |                                                                                     | MADEGROUND (Landfill Cap).<br>Firm black slightly sandy gravelly CLAY with some lenses of C&D waste.                                                                                              | 0.5 - 1.6 mbgl: C&D waste of wood, plastic, brick and concrete. |              |                                                                                                                                                                                          |           |
| 1                                       |   | MADEGROUND (C&D Waste).<br>Mixed commercial waste of video cassettes, o-rings, plastic bags/ reams, bottles and occasional paper.                                                                 | 2.3 - 2.9 mbgl: Videos, paper reems, cardboard and plastic.     |              |                                                                                                                                                                                          |           |
| 2                                       |                                                                                     | MADEGROUND (Industrial Waste).<br>Waste in sandy gravelly black sludge matrix. Moist to wet.                                                                                                      | 2.9 - 3.5 mbgl: Plastic, paper and wood (chip board).           |              |                                                                                                                                                                                          |           |
| 3                                       |  | MADEGROUND (Domestic Waste).<br>Black sludge matrix with domestic waste including plastic bottles, electrical/sanitary waste, black sludges, fabric and food packaging. Strong putrescible odour. |                                                                 |              |                                                                                                                                                                                          |           |
| 4                                       | End of trial pit - 4.8 mbgl.                                                        |                                                                                                                                                                                                   |                                                                 |              |                                                                                                                                                                                          |           |
| 5                                       |                                                                                     |                                                                                                                                                                                                   |                                                                 |              |                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: NA                                                                                                                                                                           |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167599.084   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337147.212  | Page 1 of 1                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |



Project Number: E0715

**Client:** Sligo County Council

TRIAL PIT NO: TP5

**Project Title:** Environmental Assessment

**Site Location:** Finisklin

## SUBSURFACE CONDITIONS

## SAMPLE F

0

MADEGROUND.  
Soft brown slightly sandy slightly gravelly  
CLAY with some cobbles. Gravel and  
cobbles are subrounded to rounded of  
limestone.

MADEGROUND.  
Soft black slightly sandy slightly gravelly  
CLAY. Dry to damp.

MADEGROUND.  
Soft brown slightly gravelly CLAY with some  
municipal waste (refuse sacks).

0.0 - 4.8mbgl: Strong putrescible odour.

0.4 - 1.1 mbgl: Some refuse sacks with moderately decomposed domestic waste.

1.1 - 3.0 mbgl: Occasional plastic food bottles, rubber, cardboard, and copper. Rare fabric. Putrescible/vomit odour.

2.6 mbgl: Some bundles of rubber o-rings. Occasional copper piping.

2.7 - 3.8 mbgl: Some timber, tree roots and sweet/putrescible odour.

3.0 - 3.8 mbgl: Plastic, timber and foam/fabric. Rare lead/ metal sheeting.

3.8 - 4.8 mbgl: Refuse sacks with (50%) food cartons/ tins and sanitary waste. Some home DIY materials eg plumbing sealant and PVC pipes.

End of trial pit - 4.8 mbgl.

### 3.2 mbgl: Minor seepage

43.8 mbgl: Minor seepage

[illegible]

Strike:  Level: 

Revision: Final

Page 1 of 1

Excavation Date: 16/06/09

**Excavation Method:** Tracked Mechanical Excavator

**Excavated By:** John Donlon Plant Hire

Logged By: CC

Checked By: EB

Reference Datum: maOD

**Elevation:** NA

Easting: 167679.084

Northing: 337147.212

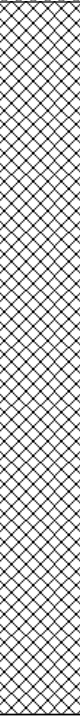
[illegible]

Strike:  Level: 

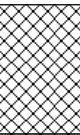
Revision: Final

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**DISCLAIMER:** This log is for environmental purposes only.

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                        |                                                                                                                                   |                          |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     |                                                                                                                                                                                        | Client: Sligo County Council                                                                                                      |                          | TRIAL PIT NO: TP6                                                                                                                                    |           |
| Project Title: Environmental Assessment |                                                                                     |                                                                                                                                                                                        | Site Location: Finisklin                                                                                                          |                          |                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                        |                                                                                                                                   |                          | SAMPLE                                                                                                                                               |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                            | COMMENTS                                                                                                                          | WATER (mbgl)             | Depth (mbgl)                                                                                                                                         | PID (ppm) |
| 0                                       |   | MADEGROUND.<br>Firm brown slightly sandy gravelly CLAY.<br>Dry to damp.                                                                                                                | 0.0 - 0.3: Some timber.                                                                                                           | 40.6mbgl: Minor seepage  | 1.4                                                                                                                                                  | 0         |
|                                         |                                                                                     | MADEGROUND (C&D).<br>Firm brown slightly sandy CLAY with many cobbles. Cobbles are of limestone and concrete.                                                                          | 0.3 - 1.1 mbgl: Rare rebar.                                                                                                       |                          |                                                                                                                                                      |           |
| 1                                       |                                                                                     | MADEGROUND (C&D).<br>Soft to firm brown/ black slightly sandy slightly gravelly CLAY with some cobbles. Gravel and cobbles are subangular to rounded of limestone and rare brick. Dry. | 1.1 - 2.3 mbgl: Some orange mottling.                                                                                             |                          |                                                                                                                                                      |           |
| 2                                       |                                                                                     | MADEGROUND.<br>Black ashy CLAY matrix with much organic debris (50%).                                                                                                                  | 2.3 - 2.6 mbgl: Organic debris (slightly decomposed) of tree roots, grass cuttings, vegetation.                                   |                          |                                                                                                                                                      |           |
| 3                                       |                                                                                     | MADEGROUND (Municipal waste).<br>Mixed waste with black sandy CLAY matrix with some ash. Dry.                                                                                          | 2.6 - 4.8 mbgl: Wood, newspaper, sanitary waste, plastic bottles/bags (c.1980), food wrappers and fabric/ clothing. Slight sheen. |                          |                                                                                                                                                      |           |
| 4                                       |  | End of trial pit - 4.8 mbgl.                                                                                                                                                           |                                                                                                                                   | 44.8mbgl: Slight seepage |                                                                                                                                                      |           |
| 5                                       |                                                                                     |                                                                                                                                                                                        |                                                                                                                                   |                          |                                                                                                                                                      |           |

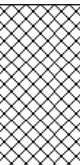
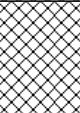
|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: 0.6 mbgl & 4.8 mbgl                                                                                                                                                          |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167759.084   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337147.212  | Page 1 of 1                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

| TRIAL PIT LOG                     |                                                                                   |                                                                                                                                                                |                                                                                                                                                               |                                                       |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |           |
|-----------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715             |                                                                                   |                                                                                                                                                                | Client: Sligo County Council                                                                                                                                  |                                                       | TRIAL PIT NO: TP7                                                                                                                                                                                        |           |
| Project Title: Finisklin Landfill |                                                                                   |                                                                                                                                                                | Site Location: Sligo                                                                                                                                          |                                                       |                                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS             |                                                                                   |                                                                                                                                                                |                                                                                                                                                               |                                                       | SAMPLE                                                                                                                                                                                                   |           |
| Depth (mbgl)                      | SYMBOL                                                                            | DESCRIPTION                                                                                                                                                    | COMMENTS                                                                                                                                                      | WATER (mbgl)                                          | Depth (mbgl)                                                                                                                                                                                             | PID (ppm) |
| 0                                 |  | MADEGROUND.<br>Slightly sandy organic CLAY with some waste.                                                                                                    | 0.4 - 1.9 mbgl: Rare pieces of plastic net/screen.                                                                                                            | 2.9 mbgl: Minor seepage<br><br>3.5 mbgl: Water strike | 3.5 - 3.9                                                                                                                                                                                                | 0         |
|                                   |                                                                                   | MADEGROUND.<br>Soft brown slightly gravelly CLAY/ SILT.<br>Some cobbles and boulders, sub-rounded to rounded of limestone. Rare brick and ceramic. Rare waste. |                                                                                                                                                               |                                                       |                                                                                                                                                                                                          |           |
| 1                                 |                                                                                   |                                                                                                                                                                | 1.9 - 3.4 mbgl: Refuse sacks of moderately decomposed sanitary waste, food waste and glass and plastic bottles. Some C&D of rare timber, fabric and concrete. |                                                       |                                                                                                                                                                                                          |           |
| 2                                 |                                                                                   | MADEGROUND (Municipal waste).<br>Mixed municipal waste with rare C&D waste. No matrix.                                                                         | 2.7 mbgl: Some metal piping and plastic hose.                                                                                                                 |                                                       |                                                                                                                                                                                                          |           |
| 3                                 |                                                                                   | MADEGROUND.<br>Industrial commercial waste with some sandy matrix.                                                                                             | 3.4 - 4.8 mbgl: Many rubber string/o-rings. Some metal machinery/ engine components. Slight iridescent sheen.                                                 |                                                       |                                                                                                                                                                                                          |           |
| 4                                 |                                                                                   |                                                                                                                                                                |                                                                                                                                                               |                                                       |                                                                                                                                                                                                          |           |
| 5                                 |                                                                                   | End of trial pit - 4.8 mbgl.                                                                                                                                   |                                                                                                                                                               |                                                       |                                                                                                                                                                                                          |           |

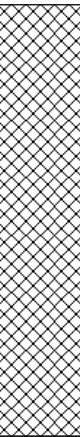
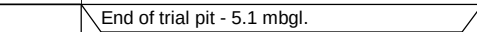
|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: 2.9 mbgl & 3.5 mbgl                                                                                                                                                          |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167733.107   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337208.351  | Page 1 of 1                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |



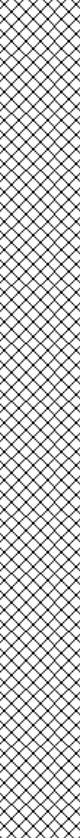
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|-------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <div>TRIAL PIT LOG</div>                        |        |                                                                                                                                                          |                                                                                                                                 |                        | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |           |
| Project Number: E0715                           |        |                                                                                                                                                          | Client: Sligo County Council                                                                                                    |                        | TRIAL PIT NO: TP8                                                                                                                                                    |           |
| Project Title: Environmental Assessment         |        |                                                                                                                                                          | Site Location: Finisklin                                                                                                        |                        |                                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                           |        |                                                                                                                                                          |                                                                                                                                 |                        | SAMPLE                                                                                                                                                               |           |
| Depth (mbgl)                                    | SYMBOL | DESCRIPTION                                                                                                                                              | COMMENTS                                                                                                                        | WATER (mbgl)           | Depth (mbgl)                                                                                                                                                         | PID (ppm) |
| 0                                               |        | TOPSOIL.                                                                                                                                                 | 0.1 - 2.7 mbgl: Refuse sacks, sanitary waste, plastic wrap/ bottles and some bundles of rubber and fabric. Rare wood and brick. |                        | 2.0                                                                                                                                                                  | 0         |
|                                                 |        | MADEGROUND (Municipal waste). Moderate to highly decomposed municipal waste with black ashy/ sandy matrix and some sludges. Rare C&D waste. Dry to damp. |                                                                                                                                 |                        |                                                                                                                                                                      |           |
|                                                 |        | Soft black/ brown/ grey sandy SILT with some gravel of limestone and shell fragments. Damp.                                                              |                                                                                                                                 |                        |                                                                                                                                                                      |           |
| 3                                               |        | End of trial pit - 3.4 mbgl.                                                                                                                             | 2.4 mbgl: Slight sheen/ scum on water.                                                                                          | 2.4 mbgl: Water level. | 3.0                                                                                                                                                                  | 0         |
|                                                 |        |                                                                                                                                                          | 2.7 - 3.4 mbgl: Black/ grey mottled (leachate) sandy silt overlying orange mottling.                                            |                        |                                                                                                                                                                      |           |
|                                                 |        |                                                                                                                                                          | 3.0-3.4 mbgl: Some orange staining and rootlets.                                                                                |                        |                                                                                                                                                                      |           |
| 4                                               |        |                                                                                                                                                          |                                                                                                                                 |                        |                                                                                                                                                                      |           |
| 5                                               |        |                                                                                                                                                          |                                                                                                                                 |                        |                                                                                                                                                                      |           |
| Excavation Date: 16/06/09                       |        |                                                                                                                                                          | Reference Datum: maOD                                                                                                           |                        | Water Strike: 2.4 mbgl                                                                                                                                               |           |
| Excavation Method: Tracked Mechanical Excavator |        |                                                                                                                                                          | Elevation: NA                                                                                                                   |                        | Strike:                                                                                                                                                              |           |
| Excavated By: John Donlon Plant Hire            |        |                                                                                                                                                          | Easting: 167519.084                                                                                                             |                        | Level:                                                                                                                                                               |           |
| Logged By: CC                                   |        |                                                                                                                                                          | Northing: 337067.212                                                                                                            |                        | Revision: Final                                                                                                                                                      |           |
| Checked By: EB                                  |        |                                                                                                                                                          |                                                                                                                                 |                        | Page 1 of 1                                                                                                                                                          |           |

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                                                                                      |                                                          |                           |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br>MALONE O'REGAN<br>ENVIRONMENTAL SERVICES LTD |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     | Client: Sligo County Council                                                                                                                                                                                                                         |                                                          |                           | TRIAL PIT NO: TP9                                                                                                                                                                       |           |
| Project Title: Environmental Assessment |                                                                                     | Site Location: Finisklin                                                                                                                                                                                                                             |                                                          |                           |                                                                                                                                                                                         |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                                                                                      |                                                          |                           | SAMPLE                                                                                                                                                                                  |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                                                                                          | COMMENTS                                                 | WATER (mbgl)              | Depth (mbgl)                                                                                                                                                                            | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Slightly sandy CLAY with some organic detritus.                                                                                                                                                                                       | 0.5 - 1.3 mbgl: Metal. Rare rebar. Rare video cassettes. | 4.2.6 mbgl: Minor seepage |                                                                                                                                                                                         |           |
|                                         |                                                                                     | MADEGROUND.<br>Mixed commercial/ C&D/ domestic waste in grey/ brown slightly sandy slightly gravelly CLAY matrix. Domestic waste of plastic refuse sacks with moderately decomposed waste with paper and plastic. Rare C&D of rebar and steel cable. |                                                          |                           |                                                                                                                                                                                         |           |
| 1                                       |                                                                                     | MADEGROUND.<br>Domestic waste with black sandy sludge matrix. Plastic refuse bags of sanitary waste.                                                                                                                                                 |                                                          |                           |                                                                                                                                                                                         |           |
| 2                                       |                                                                                     | 1.3 - 2.8 mbgl: Plastic wrap/ bags, sanitary waste and refuse sacks. Rare brick and concrete blocks.                                                                                                                                                 |                                                          |                           |                                                                                                                                                                                         |           |
|                                         |                                                                                     | 2.8 - 3.5 mbgl: Degraded waste with plastic, a tyre and glass bottles. Strong putrescible/ vomit odour.                                                                                                                                              |                                                          |                           |                                                                                                                                                                                         |           |
| 3                                       |                                                                                     | 3.5 - 4.3 mbgl: Carpet, fabric and plastic wrap.                                                                                                                                                                                                     |                                                          |                           |                                                                                                                                                                                         |           |
|                                         |  | MADEGROUND.<br>Mixed industrial/ commercial and C&D waste with some sandy sludge matrix.                                                                                                                                                             | 4.3 - 4.6 mbgl: Some black staining.                     |                           |                                                                                                                                                                                         |           |
| 4                                       |                                                                                     | MADEGROUND.<br>Reworked soft brown slightly sandy CLAY/SILT with rare lenses of shelly sand.                                                                                                                                                         |                                                          |                           |                                                                                                                                                                                         |           |
|                                         | End of trial pit - 4.6 mbgl.                                                        |                                                                                                                                                                                                                                                      |                                                          |                           |                                                                                                                                                                                         |           |
| 5                                       |                                                                                     |                                                                                                                                                                                                                                                      |                                                          |                           |                                                                                                                                                                                         |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: 2.6 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 169599.084   | Revision: Final Page 1 of 1                                                                                                                                                                |
| Logged By: CC                                   | Northing: 337067.212  |                                                                                                                                                                                            |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                           |                                                                                                                                                                 |                          |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br>MALONE O'REGAN<br>ENVIRONMENTAL SERVICES LTD. |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     | Client: Sligo County Council                                                                                                                              |                                                                                                                                                                 |                          | TRIAL PIT NO: TP10                                                                                                                                                                       |           |
| Project Title: Environmental Assessment |                                                                                     | Site Location: Finisklin                                                                                                                                  |                                                                                                                                                                 |                          |                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                           |                                                                                                                                                                 |                          | SAMPLE                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                               | COMMENTS                                                                                                                                                        | WATER (mbgl)             | Depth (mbgl)                                                                                                                                                                             | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Firm dark brown slightly clayey slightly sandy GRAVEL with cobbles and boulders. Gravel and cobbles of limestone, brick and concrete. Dry. | 0 - 1.4 mbgl: Some timber and organic detritus.<br><br>0.3 mbgl: Some white plastic wrap and fabric/rope.                                                       | 42.9 mbgl: Water strike. |                                                                                                                                                                                          |           |
| 1                                       |                                                                                     | MADEGROUND (Municipal waste).<br>Mixed moderately decomposed municipal waste of domestic waste with some C&D with no matrix. Dry.                         | 1.4 - 3.2 mbgl: Moderately decomposed waste with organic matter, glass bottles, plastic sheeting, food wrappers, newspaper (1994). Some timber and metal pipes. |                          |                                                                                                                                                                                          |           |
| 2                                       |                                                                                     |                                                                                                                                                           |                                                                                                                                                                 |                          | 1.9                                                                                                                                                                                      | 0.2       |
| 2.1                                     |                                                                                     |                                                                                                                                                           |                                                                                                                                                                 |                          |                                                                                                                                                                                          | 0         |
| 3                                       |                                                                                     |                                                                                                                                                           |                                                                                                                                                                 |                          |                                                                                                                                                                                          |           |
| 4                                       |                                                                                     |                                                                                                                                                           |                                                                                                                                                                 |                          |                                                                                                                                                                                          |           |
| 5                                       |  | Stiff brown slightly sandy gravelly CLAY.<br>Dry to damp.                                                                                                 |                                                                                                                                                                 |                          |                                                                                                                                                                                          |           |
|                                         |  | End of trial pit - 5.1 mbgl.                                                                                                                              |                                                                                                                                                                 |                          |                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: 2.9 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167679.084   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337067.212  | Page 1 of 1                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

| TRIAL PIT LOG                           |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |           |
|-----------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                    |                                                                                                                                                                      | Client: Sligo County Council                                                                                        |              | TRIAL PIT NO: TP11                                                                                                                                                                                       |           |
| Project Title: Environmental Assessment |                                                                                    |                                                                                                                                                                      | Site Location: Finisklin                                                                                            |              |                                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              | SAMPLE                                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                             | DESCRIPTION                                                                                                                                                          | COMMENTS                                                                                                            | WATER (mbgl) | Depth (mbgl)                                                                                                                                                                                             | PID (ppm) |
| 0                                       |  | MADEGROUND (Landfill Cap). Firm brown slightly sandy gravelly CLAY with many cobbles. Gravel and cobbles angular to subangular of limestone. Some brick and ceramic. | 0.0 - 0.8 mbgl: Pockets of topsoil with timber.                                                                     |              | 0.8                                                                                                                                                                                                      | 0         |
| 1                                       |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              | 1.6                                                                                                                                                                                                      | 0         |
| 2                                       |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              | 2.7                                                                                                                                                                                                      | 0         |
| 3                                       |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              |                                                                                                                                                                                                          |           |
|                                         |                                                                                    | MADEGROUND. Soft to firm brown slightly sandy gravelly CLAY with occasional cobbles. Gravel and cobbles angular to subrounded of limestone.                          | 2.6 - 3.05 mbgl: Some orange mottling. Some pockets of degraded waste including plastic sacks, glass and food cans. |              |                                                                                                                                                                                                          |           |
|                                         |                                                                                    | MADEGROUND. Brown slightly sandy gravelly CLAY with some cobbles and boulders of limestone, concrete, brick. Some pockets of decomposed waste. Dry.                  | 3.05 - 3.8 mbgl: Concrete and plastic. Plastic sacks of food and glass bottles. Black staining.                     |              |                                                                                                                                                                                                          |           |
|                                         |                                                                                    | MADEGROUND (Municipal waste). Black highly decomposed municipal waste as black gritty sludge with rare clay matrix.                                                  | 3.8 - 5.4 mbgl: Some identifiable plastic and fabric.                                                               |              |                                                                                                                                                                                                          |           |
| 4                                       |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              | 4.6                                                                                                                                                                                                      | 0         |
| 5                                       |                                                                                    |                                                                                                                                                                      |                                                                                                                     |              |                                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 16/06/09                       | Reference Datum: maOD | Water Strike: NA                                                                                                                                                                           |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167679.084   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337067.212  | Page 1 of 2                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |



2B Richview Office Park,  
Clonskeagh,  
Dublin 14

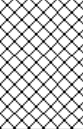
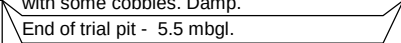
**Client:** Sligo County Council

**Site Location:** Finisklin

**TRIAL PIT NO: TP11**

## SUBSURFACE CONDITIONS

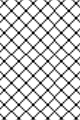
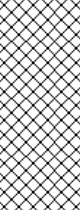
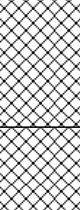
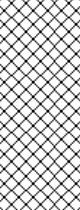
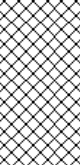
## SAMPLE

| Depth<br>(mbgl) | SYMBOL                                                                            | DESCRIPTION                                                          | COMMENTS                             | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm) |
|-----------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------|-----------------|-----------------|--------------|
|                 |  |                                                                      |                                      |                 |                 |              |
|                 |  | Brown slightly sandy slightly gravelly CLAY with some cobbles. Damp. | 5.4 - 5.5 mbgl: Some black mottling. |                 |                 |              |
|                 |  | End of trial pit - 5.5 mbgl.                                         |                                      |                 |                 |              |
| 6               |                                                                                   |                                                                      |                                      |                 |                 |              |
| 7               |                                                                                   |                                                                      |                                      |                 |                 |              |
| 8               |                                                                                   |                                                                      |                                      |                 |                 |              |
| 9               |                                                                                   |                                                                      |                                      |                 |                 |              |
| 10              |                                                                                   |                                                                      |                                      |                 |                 |              |

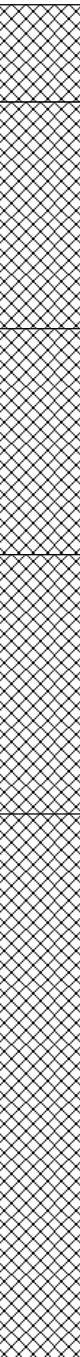
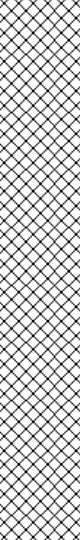
|                  |            |
|------------------|------------|
| Reference Datum: | maOD       |
| Elevation:       | NA         |
| Easting:         | 167679.084 |
| Northing:        | 337067.212 |

|                                                                                               |                                                                                              |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Water Strike: NA                                                                              |                                                                                              |
| Strike:  | Level:  |
| Revision: Final                                                                               | Final                                                                                        |

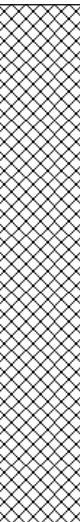
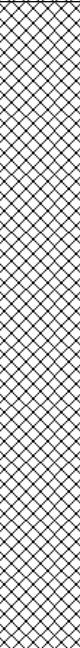
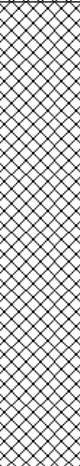


| TRIAL PIT LOG                                                                                                        |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD</small>                                                          |           |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                                                                                                |                                                                                     | Client: Sligo County Council                                                                                                                              |                                                                                                                                                                                               |                                                                                                              | TRIAL PIT NO: TP12                                                                                                                                                                                                                                               |           |
| Project Title: Environmental Assessment                                                                              |                                                                                     | Site Location: Finisklin                                                                                                                                  |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| SUBSURFACE CONDITIONS                                                                                                |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              | SAMPLE                                                                                                                                                                                                                                                           |           |
| Depth (mbgl)                                                                                                         | SYMBOL                                                                              | DESCRIPTION                                                                                                                                               | COMMENTS                                                                                                                                                                                      | WATER (mbgl)                                                                                                 | Depth (mbgl)                                                                                                                                                                                                                                                     | PID (ppm) |
| 0                                                                                                                    |    | MADEGROUND.<br>Brown slightly gravelly sandy CLAY with rare C&D waste. Moist.                                                                             | 0.0 - 0.2 mbgl: Rare brick and timber.                                                                                                                                                        |  4.3 mbgl: Minor seepage | 1.2                                                                                                                                                                                                                                                              | 0         |
|                                                                                                                      |                                                                                     | MADEGROUND.<br>Soft orange/brown SAND and GRAVEL with some clay matrix. Wet.                                                                              |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| 1                                                                                                                    |    | MADEGROUND.<br>Soft to firm brown slightly sandy slightly gravelly CLAY with rare cobbles. Gravel and cobbles of limestone, brick and some timber. Moist. | 0.6 - 1.9 mbgl: Rare brick, plastic and timber.                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
|                                                                                                                      |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| 2                                                                                                                    |  | MADEGROUND (Municipal waste).<br>Mixed highly decomposed waste with black sand and clay matrix. Damp.                                                     | 2.4 - 3.5 mbgl: Some moderately degraded waste of fabric and rubber sheeting.                                                                                                                 |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
|                                                                                                                      |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| 3                                                                                                                    |  | MADEGROUND (Municipal waste).<br>Mixed decomposed municipal waste with slightly sandy slightly gravelly clay matrix and some cobbles. Dry to damp.        | 3.5 - 5.7 mbgl: Refuse sacks of decomposed waste of newspaper (23/10/83), food cans, fabric, shredded plastic, glass bottles. Rare metal/ mechanical parts. Strong putrescible 'vomit' odour. |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
|                                                                                                                      |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| 4                                                                                                                    |  |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              | 4.8                                                                                                                                                                                                                                                              | 0         |
|                                                                                                                      |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| 5                                                                                                                    |  |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
|                                                                                                                      |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |
| Excavation Date: 16/06/09<br>Excavation Method: Tracked Mechanical Excavator<br>Excavated By: John Donlon Plant Hire |                                                                                     |                                                                                                                                                           | Reference Datum: maOD<br>Elevation: NA<br>Easting: 167829.975<br>Northing: 337061.196                                                                                                         |                                                                                                              | Water Strike: 4.3 mbgl and 5.7 mbgl<br>Strike:  Level: <br>Revision: Final Page 1 of 2 |           |
| Logged By: CC<br>Checked By: EB                                                                                      |                                                                                     |                                                                                                                                                           |                                                                                                                                                                                               |                                                                                                              |                                                                                                                                                                                                                                                                  |           |

|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|-------------------------------------------------|-------------|------------------------------|------------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <div>TRIAL PIT LOG</div>                        |             |                              |                              |                           | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |              |
| Project Number: E0715                           |             |                              | Client: Sligo County Council |                           | TRIAL PIT NO: TP12                                                                                                                                                  |              |
| Project Title: Environmental Assessment         |             |                              | Site Location: Finisklin     |                           |                                                                                                                                                                     |              |
| SUBSURFACE CONDITIONS                           |             |                              |                              |                           | SAMPLE                                                                                                                                                              |              |
| Depth<br>(mbgl)                                 | SYMBOL      | DESCRIPTION                  | COMMENTS                     | WATER<br>(mbgl)           | Depth<br>(mbgl)                                                                                                                                                     | PID<br>(ppm) |
|                                                 | <div></div> |                              |                              | 4 5.7 mbgl: Minor seepage |                                                                                                                                                                     |              |
|                                                 |             | End of trial pit - 5.7 mbgl. |                              |                           |                                                                                                                                                                     |              |
| 6                                               |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
| 7                                               |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
| 8                                               |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
| 9                                               |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
|                                                 |             |                              |                              |                           |                                                                                                                                                                     |              |
| 10                                              |             |                              |                              |                           |                                                                                                                                                                     |              |
| Excavation Date: 16/06/09                       |             |                              | Reference Datum: maOD        |                           | Water Strike: 4.3 mbgl and 5.7 mbgl                                                                                                                                 |              |
| Excavation Method: Tracked Mechanical Excavator |             |                              | Elevation: NA                |                           | Strike: ▽ Level: ▼                                                                                                                                                  |              |
| Excavated By: John Donlon Plant Hire            |             |                              | Easting: 167829.975          |                           | Revision: Final Page 2 of 2                                                                                                                                         |              |
| Logged By: CC                                   |             |                              | Northing: 337061.196         |                           |                                                                                                                                                                     |              |
| Checked By: EB                                  |             |                              |                              |                           |                                                                                                                                                                     |              |

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                   |                              |                     |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |           |                                                                                                                                                                                             |
|-----------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Number: E0715                   |                                                                                     |                                                                                                                                                                                   | Client: Sligo County Council |                     | TRIAL PIT NO: TP13                                                                                                                                                                                       |           |                                                                                                                                                                                             |
| Project Title: Environmental Assessment |                                                                                     |                                                                                                                                                                                   | Site Location: Finisklin     |                     |                                                                                                                                                                                                          |           |                                                                                                                                                                                             |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                   |                              |                     | SAMPLE                                                                                                                                                                                                   |           |                                                                                                                                                                                             |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                       | COMMENTS                     | WATER (mbgl)        | Depth (mbgl)                                                                                                                                                                                             | PID (ppm) |                                                                                                                                                                                             |
| 0                                       |   | MADEGROUND.<br>Soft light brown sandy CLAY with some rootlets. Dry.                                                                                                               |                              |                     |                                                                                                                                                                                                          |           |                                                                                                                                                                                             |
|                                         |                                                                                     | MADEGROUND.<br>Soft brown slightly gravelly sandy CLAY/ SILT with some cobbles and boulders. Gravel, cobbles and boulders are subangular to rounded of limestone, concrete. Damp. |                              |                     |                                                                                                                                                                                                          |           |                                                                                                                                                                                             |
| 1                                       |                                                                                     | MADEGROUND (Landfill Cap).<br>Soft brown slightly gravelly sandy SILT with some pockets of gravelly silt/ clay. Damp.                                                             |                              |                     |                                                                                                                                                                                                          |           | 1.0 - 1.7 mbgl: Black mottling.                                                                                                                                                             |
|                                         |                                                                                     | MADEGROUND.<br>Soft slightly sandy slightly gravelly CLAY. Gravel of concrete and limestone.                                                                                      |                              |                     |                                                                                                                                                                                                          |           | 1.7 - 1.9 mbgl: Some decaying organic detritus.                                                                                                                                             |
| 2                                       |                                                                                     | MADEGROUND (Municipal waste).<br>Mixed decomposed waste with black slightly gravelly sandy/ ashy matrix.                                                                          |                              |                     |                                                                                                                                                                                                          |           | 2.5 - 4.2 mbgl: Black refuse sacks of decomposed waste including bottles and plastic wrappers. Some timber, rare metal. Slight hydrocarbon and putrescible odour. Slight sheen on leachate. |
| 3                                       |  |                                                                                                                                                                                   | 4.2 mbgl: Pit collapse.      | 4.3.9 mbgl: Ingress | 3.9 - 4.2                                                                                                                                                                                                | 3.1       |                                                                                                                                                                                             |
| 4                                       |                                                                                     | End of trial pit - 4.2 mbgl.                                                                                                                                                      |                              |                     |                                                                                                                                                                                                          |           |                                                                                                                                                                                             |
| 5                                       |                                                                                     |                                                                                                                                                                                   |                              |                     |                                                                                                                                                                                                          |           |                                                                                                                                                                                             |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 3.9 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167679.084   | Revision: Final Page 1 of 1                                                                                                                                                                |
| Logged By: CC                                   | Northing: 336987.212  |                                                                                                                                                                                            |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                          |                                                           |              |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     |                                                                                                                                                          | Client: Sligo County Council                              |              | TRIAL PIT NO: TP14                                                                                                                                   |           |
| Project Title: Environmental Assessment |                                                                                     |                                                                                                                                                          | Site Location: Finisklin                                  |              |                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                          |                                                           |              | SAMPLE                                                                                                                                               |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                              | COMMENTS                                                  | WATER (mbgl) | Depth (mbgl)                                                                                                                                         | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Soft brown/ grey sandy SILT with rare large boulders.                                                                                     |                                                           |              |                                                                                                                                                      |           |
| 1                                       |                                                                                     |                                                                                                                                                          |                                                           |              |                                                                                                                                                      |           |
| 2                                       |   | MADEGROUND.<br>Soft brown/ grey slightly gravelly sandy SILT with some rare C&D waste. Gravel of brick, timber and limestone. Some lenses of sandy clay. | 1.6 - 3.6 mbgl: Rare brick, plastic and timber.           |              |                                                                                                                                                      |           |
| 3                                       |                                                                                     |                                                                                                                                                          |                                                           |              |                                                                                                                                                      |           |
| 4                                       |  | MADEGROUND.<br>Mixed waste with soft brown/ black sandy silt matrix.                                                                                     | 3.6 - 5.5 mbgl: Plastic, rubber, timber, glass and paper. |              | 3.6                                                                                                                                                  | 0.3       |
| 5                                       |                                                                                     |                                                                                                                                                          |                                                           |              |                                                                                                                                                      |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: NA                                                                                                                                                                           |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167759.084   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 336987.212  | Page 1 of 2                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

**MOR**  
**MALONE O'REGAN**  
ENVIRONMENTAL SERVICES Ltd.

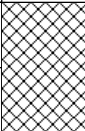
2B Richview Office Park,  
Clonskeagh,  
Dublin 14

**Client:** Sligo County Council

**Site Location:** Finisklin

**TRIAL PIT NO: TP14**

## SAMPLE

| Depth<br>(mbgl) | SYMBOL                                                                            | DESCRIPTION                  | COMMENTS | WATER<br>(mbgl) | Depth<br>(mbgl) | PID<br>(ppm) |
|-----------------|-----------------------------------------------------------------------------------|------------------------------|----------|-----------------|-----------------|--------------|
|                 |  |                              |          |                 |                 |              |
|                 |  | Soft brown sandy SILT.       |          |                 |                 |              |
|                 |                                                                                   | End of trial pit - 5.5 mbgl. |          |                 |                 |              |
| 6               |                                                                                   |                              |          |                 |                 |              |
| 7               |                                                                                   |                              |          |                 |                 |              |
| 8               |                                                                                   |                              |          |                 |                 |              |
| 9               |                                                                                   |                              |          |                 |                 |              |
| 10              |                                                                                   |                              |          |                 |                 |              |

Water Strike: NA  
 Strike:  Level:   
 Revision: Final Page 2 of 2

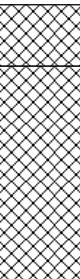
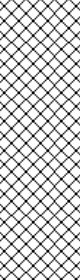


**MOR**  
**MALONE O'REGAN**  
ENVIRONMENTAL SERVICES Ltd.

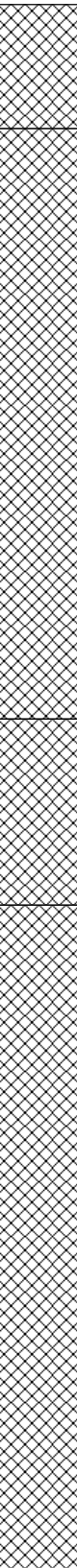
2B Richview Office Park,  
Clonskeagh,  
Dublin 14

**DISCLAIMER:** This log is for environmental purposes only.

|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|-------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| TRIAL PIT LOG                                   |                                                                                   |                                                                          |                              |                 |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> <div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div> |              |
| Project Number: E0715                           |                                                                                   |                                                                          | Client: Sligo County Council |                 | TRIAL PIT NO: TP15                                                                                                                                                                                             |              |
| Project Title: Environmental Assessment         |                                                                                   |                                                                          | Site Location: Finisklin     |                 |                                                                                                                                                                                                                |              |
| SUBSURFACE CONDITIONS                           |                                                                                   |                                                                          |                              |                 | SAMPLE                                                                                                                                                                                                         |              |
| Depth<br>(mbgl)                                 | SYMBOL                                                                            | DESCRIPTION                                                              | COMMENTS                     | WATER<br>(mbgl) | Depth<br>(mbgl)                                                                                                                                                                                                | PID<br>(ppm) |
|                                                 |  |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |  | Soft black sandy SILT with some gravel of limestone and shell fragments. |                              |                 | 5.3                                                                                                                                                                                                            | 0.4          |
|                                                 |  | End of trial pit - 5.5 mbgl.                                             |                              |                 | 5.5                                                                                                                                                                                                            | 0            |
| 6                                               |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
| 7                                               |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
| 8                                               |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
| 9                                               |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
|                                                 |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
| 10                                              |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |
| Excavation Date: 17/06/09                       |                                                                                   |                                                                          | Reference Datum: maOD        |                 | Water Strike: 4.5 mbgl                                                                                                                                                                                         |              |
| Excavation Method: Tracked Mechanical Excavator |                                                                                   |                                                                          | Elevation: NA                |                 | Strike:  Level:                      |              |
| Excavated By: John Donlon Plant Hire            |                                                                                   |                                                                          | Easting: 167839.084          |                 | Revision: Final                                                                                                                                                                                                |              |
| Logged By: CC                                   |                                                                                   |                                                                          | Northing: 336987.212         |                 | Page 2 of 2                                                                                                                                                                                                    |              |
| Checked By: EB                                  |                                                                                   |                                                                          |                              |                 |                                                                                                                                                                                                                |              |

| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                            |                                                                                                |                        |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><b>MALONE O'REGAN</b><br>ENVIRONMENTAL SERVICES LTD. |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     | Client: Sligo County Council                                                                                                                                                               |                                                                                                |                        | TRIAL PIT NO: TP16                                                                                                                                                                              |           |
| Project Title: Environmental Assessment |                                                                                     | Site Location: Finisklin                                                                                                                                                                   |                                                                                                |                        |                                                                                                                                                                                                 |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                            |                                                                                                |                        | SAMPLE                                                                                                                                                                                          |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                                | COMMENTS                                                                                       | WATER (mbgl)           | Depth (mbgl)                                                                                                                                                                                    | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Soft light brown slightly sandy slightly gravelly organic CLAY.                                                                                                             | 0.9 - 1.4 mbgl: Occasional plastic and rootlets.                                               |                        | 1.3 - 1.6                                                                                                                                                                                       |           |
|                                         |                                                                                     | MADEGROUND (Landfill cap).<br>Waste with soft brown/ grey slightly gravelly CLAY with many cobbles and boulders. Gravel, cobbles and boulders of limestone, concrete and rare brick. Damp. |                                                                                                |                        |                                                                                                                                                                                                 |           |
| 1                                       |                                                                                     | MADEGROUND.<br>Brown slightly sandy organic SILT with some gravel and cobbles with lenses of organic detritus (reeds, grass, rootlets).                                                    |                                                                                                |                        |                                                                                                                                                                                                 |           |
| 2                                       |  | MADEGROUND.<br>Mixed highly decomposed waste as SAND and GRAVEL with some black silty sludge matrix and lenses of sludge.                                                                  | 1.9 - 4.9 mbgl: Some identifiable waste of newspapers, plastic and grass. Slight greasy odour. | 4.7 mbgl: Water strike | 2.2                                                                                                                                                                                             | 0.1       |
| 3                                       |                                                                                     |                                                                                                                                                                                            |                                                                                                |                        | 3.0 - 4.0                                                                                                                                                                                       | 0.1       |
| 4                                       |                                                                                     |                                                                                                                                                                                            |                                                                                                |                        |                                                                                                                                                                                                 |           |
| 5                                       |  | Grey/ black slightly sandy SILT with some pockets of wet sludge. Damp.                                                                                                                     | 4.9 - 5.1 mbgl: Some black mottling.                                                           |                        |                                                                                                                                                                                                 |           |
|                                         |                                                                                     | End of trial pit - 5.1mbgl.                                                                                                                                                                |                                                                                                |                        |                                                                                                                                                                                                 |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 4.7 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167884.349   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 337066.474  | Page 1 of 1                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

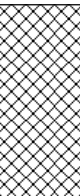
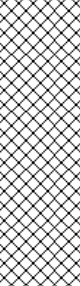
| TRIAL PIT LOG                           |                                                                                    |                                                                                                                                                  |                                                                                                                                                                                                                         |                        |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> |           |
|-----------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                    | Client: Sligo County Council                                                                                                                     |                                                                                                                                                                                                                         |                        | TRIAL PIT NO: TP17                                                                                                                                   |           |
| Project Title: Environmental Assessment |                                                                                    | Site Location: Finisklin                                                                                                                         |                                                                                                                                                                                                                         |                        |                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                   |                                                                                    |                                                                                                                                                  |                                                                                                                                                                                                                         |                        | SAMPLE                                                                                                                                               |           |
| Depth (mbgl)                            | SYMBOL                                                                             | DESCRIPTION                                                                                                                                      | COMMENTS                                                                                                                                                                                                                | WATER (mbgl)           | Depth (mbgl)                                                                                                                                         | PID (ppm) |
| 0                                       |  | MADEGROUND.<br>Soft grey/ brown slightly gravelly sandy CLAY/ SILT with some cobbles. Gravel and cobbles of limestone and shell fragments. Damp. | 0.4 - 2.3 mbgl: Waste of timber, plastic and piping. Some orange mottling.                                                                                                                                              |                        |                                                                                                                                                      |           |
|                                         |                                                                                    | MADEGROUND.<br>Soft brown slightly sandy slightly gravelly CLAY with some cobbles and boulders. Some lenses of waste. Dry to damp.               |                                                                                                                                                                                                                         |                        |                                                                                                                                                      |           |
| 1                                       |                                                                                    |                                                                                                                                                  |                                                                                                                                                                                                                         |                        |                                                                                                                                                      |           |
| 2                                       |                                                                                    |                                                                                                                                                  |                                                                                                                                                                                                                         |                        |                                                                                                                                                      |           |
|                                         |                                                                                    | MADEGROUND.<br>Waste with some black slightly sandy clay matrix with gravel of limestone, brick, concrete, metal and plastic. Dry.               | 2.3 - 2.6 mbgl: Some pockets of organic detritus, some brick, concrete, metal.                                                                                                                                          |                        |                                                                                                                                                      |           |
| 3                                       |                                                                                    | MADEGROUND.<br>Mixed highly decomposed waste (recovered as slightly gravelly sand). Damp.                                                        | 2.9 - 4.9 mbgl: Some identifiable degraded waste including plastic, fabric, sanitary waste, tyres, metal, oil container, brick, concrete and timber. Strong organic decay odour. Some hydrocarbon staining on leachate. |                        |                                                                                                                                                      |           |
| 4                                       |                                                                                    |                                                                                                                                                  |                                                                                                                                                                                                                         |                        |                                                                                                                                                      |           |
| 5                                       |                                                                                    |                                                                                                                                                  | 4.9 mbgl: Degraded hydrocarbon on leachate.                                                                                                                                                                             | 4.9 mbgl: Water strike | 5.0                                                                                                                                                  | 0         |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 4.9 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167800.71    |                                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 336900.931  | Revision: Final Page 1 of 2                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

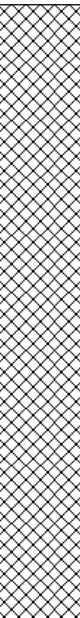
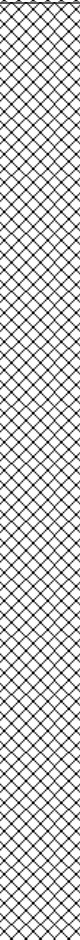
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|-------------------------------------------------|-------------|------------------------------|------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <div>TRIAL PIT LOG</div>                        |             |                              |                              |                 | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |              |
| Project Number: E0715                           |             |                              | Client: Sligo County Council |                 | TRIAL PIT NO: TP17                                                                                                                                                   |              |
| Project Title: Environmental Assessment         |             |                              | Site Location: Finisklin     |                 |                                                                                                                                                                      |              |
| SUBSURFACE CONDITIONS                           |             |                              |                              |                 | SAMPLE                                                                                                                                                               |              |
| Depth<br>(mbgl)                                 | SYMBOL      | DESCRIPTION                  | COMMENTS                     | WATER<br>(mbgl) | Depth<br>(mbgl)                                                                                                                                                      | PID<br>(ppm) |
|                                                 | <div></div> |                              |                              |                 |                                                                                                                                                                      |              |
|                                                 |             | End of trial pit - 5.3 mbgl. |                              |                 |                                                                                                                                                                      |              |
| 6                                               |             |                              |                              |                 |                                                                                                                                                                      |              |
| 7                                               |             |                              |                              |                 |                                                                                                                                                                      |              |
| 8                                               |             |                              |                              |                 |                                                                                                                                                                      |              |
| 9                                               |             |                              |                              |                 |                                                                                                                                                                      |              |
| 10                                              |             |                              |                              |                 |                                                                                                                                                                      |              |
| Excavation Date: 17/06/09                       |             |                              | Reference Datum: maOD        |                 | Water Strike: 4.9 mbgl                                                                                                                                               |              |
| Excavation Method: Tracked Mechanical Excavator |             |                              | Elevation: NA                |                 | Strike: ▽ Level: ▼                                                                                                                                                   |              |
| Excavated By: John Donlon Plant Hire            |             |                              | Easting: 167800.71           |                 | Revision: Final                                                                                                                                                      |              |
| Logged By: CC                                   |             |                              | Northing: 336900.931         |                 | Page 2 of 2                                                                                                                                                          |              |
| Checked By: EB                                  |             |                              |                              |                 |                                                                                                                                                                      |              |

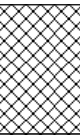
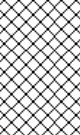
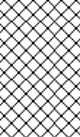


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|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <div>TRIAL PIT LOG</div>                        |                                                                                                                            |                                                                                                                                  |                                         |                       | <div><div><div>MOR</div><div>MALONE O'REGAN</div><div>ENVIRONMENTAL SERVICES LTD.</div></div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div></div> |           |
| Project Number: E0715                           |                                                                                                                            |                                                                                                                                  | Client: Sligo County Council            |                       | TRIAL PIT NO: TP18                                                                                                                                                   |           |
| Project Title: Environmental Assessment         |                                                                                                                            |                                                                                                                                  | Site Location: Finisklin                |                       |                                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                           |                                                                                                                            |                                                                                                                                  |                                         |                       | SAMPLE                                                                                                                                                               |           |
| Depth (mbgl)                                    | SYMBOL                                                                                                                     | DESCRIPTION                                                                                                                      | COMMENTS                                | WATER (mbgl)          | Depth (mbgl)                                                                                                                                                         | PID (ppm) |
| 0                                               |                                                                                                                            | MADEGROUND.<br>Soft brown organic slightly sandy slightly gravelly CLAY. Damp.                                                   | 0.0 - 0.4 mbgl: Some orange staining.   | <br>3.8 mbgl: Seepage |                                                                                                                                                                      |           |
|                                                 |                                                                                                                            | MADEGROUND.<br>Soft grey/ brown slightly sandy CLAY/ SILT.<br>Rare gravel of limestone and brick. Damp.                          | 0.4 - 0.8 mbgl: Some white mottling.    |                       |                                                                                                                                                                      |           |
| 1                                               |                                                                                                                            | MADEGROUND.<br>Soft light brown slightly sandy slightly gravelly CLAY. Gravel is of limestone and brick. Rare mixed waste. Damp. | 0.8 - 1.7 mbgl: Some plastic and brick. |                       |                                                                                                                                                                      |           |
| 2                                               | MADEGROUND.<br>Mixed highly decomposed municipal/domestic waste with some black slightly gravelly silty sand matrix. Damp. | 1.7 - 3.9 mbgl: Some identifiable waste including plastic, glass bottles, and fabric/ clothing.                                  |                                         |                       |                                                                                                                                                                      |           |
| 3                                               |                                                                                                                            | 3.5 mbgl: Waste of fabric, metal, tyres, some oil/fuel cans with slight sheen.                                                   |                                         |                       |                                                                                                                                                                      |           |
| 4                                               |                                                                                                                            | Soft black slightly gravelly sandy SILT.                                                                                         |                                         |                       |                                                                                                                                                                      |           |
|                                                 |                                                                                                                            | End of trial pit - 4.3 mbgl.                                                                                                     |                                         |                       |                                                                                                                                                                      |           |
| 5                                               |                                                                                                                            |                                                                                                                                  |                                         |                       |                                                                                                                                                                      |           |
| Excavation Date: 17/06/09                       |                                                                                                                            |                                                                                                                                  | Reference Datum: maOD                   |                       | Water Strike: 3.8 mbgl                                                                                                                                               |           |
| Excavation Method: Tracked Mechanical Excavator |                                                                                                                            |                                                                                                                                  | Elevation: NA                           |                       | Strike:  Level:                                                                                                                                                      |           |
| Excavated By: John Donlon Plant Hire            |                                                                                                                            |                                                                                                                                  | Easting: 167796.529                     |                       | Revision: Final                                                                                                                                                      |           |
| Logged By: CC                                   |                                                                                                                            |                                                                                                                                  | Northing: 336860.226                    |                       | Page 1 of 1                                                                                                                                                          |           |
| Checked By: EB                                  |                                                                                                                            |                                                                                                                                  |                                         |                       |                                                                                                                                                                      |           |

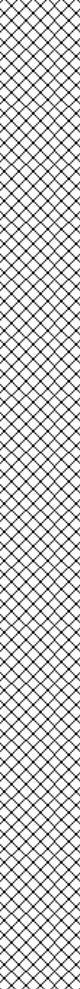
| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                     |                                                                                                                        |                                                                                                         |  <div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div> |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     | Client: Sligo County Council                                                                                                                        |                                                                                                                        |                                                                                                         | TRIAL PIT NO: TP19                                                                                                                                   |           |
| Project Title: Environmental Assessment |                                                                                     | Site Location: Finisklin                                                                                                                            |                                                                                                                        |                                                                                                         |                                                                                                                                                      |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                     |                                                                                                                        |                                                                                                         | SAMPLE                                                                                                                                               |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                         | COMMENTS                                                                                                               | WATER (mbgl)                                                                                            | Depth (mbgl)                                                                                                                                         | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Soft dark brown slightly gravelly sandy CLAY with some cobbles. Gravel and cobbles are of brick and concrete. Some mixed waste. Dry. | 0.0 - 0.6 mbgl: Brick, reinforced concrete, plastic and metal beams.                                                   |  4.2 mbgl: Seepage |                                                                                                                                                      |           |
|                                         |                                                                                     | MADEGROUND.<br>Brown slightly sandy gravelly CLAY with cobble size pockets of waste. Dry.                                                           | 0.6 - 1.5 mbgl: Fabric, timber, metal, plastic bottles/ wrappers/ bags and copper piping.                              |                                                                                                         |                                                                                                                                                      |           |
| 1                                       |    | MADEGROUND.<br>Mixed moderately decomposed waste with black ashy sandy gravel matrix. Dry.                                                          | 1.5 - 4.2 mbgl: Refuse sacks, plastic bags, bales of poly bags, fabric, rope and occasional timber. Putrescible odour. |                                                                                                         |                                                                                                                                                      |           |
| 2                                       |                                                                                     |                                                                                                                                                     |                                                                                                                        |                                                                                                         |                                                                                                                                                      |           |
| 3                                       |                                                                                     |                                                                                                                                                     |                                                                                                                        |                                                                                                         |                                                                                                                                                      |           |
| 4                                       |  | Soft grey slightly gravelly sandy SILT. Damp.                                                                                                       | 4.2 - 4.4 mbgl: Black mottling.                                                                                        |                                                                                                         |                                                                                                                                                      |           |
|                                         |                                                                                     | End of trial pit - 4.4 mbgl.                                                                                                                        |                                                                                                                        |                                                                                                         |                                                                                                                                                      |           |
| 5                                       |                                                                                     |                                                                                                                                                     |                                                                                                                        |                                                                                                         |                                                                                                                                                      |           |

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|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 4.2 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167919.084   | Revision: Final                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 336907.212  | Page 1 of 1                                                                                                                                                                                |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |

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| <h1>TRIAL PIT LOG</h1>                          |                                                                                     |                                                                                                                                                         |                                                                          |                 | <div><div>2B Richview Office Park,<br/>Clonskeagh,<br/>Dublin 14</div><div>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</div></div> |              |
| Project Number: E0715                           |                                                                                     |                                                                                                                                                         | Client: Sligo County Council                                             |                 | TRIAL PIT NO: TP20                                                                                                                                                                                                      |              |
| Project Title: Environmental Assessment         |                                                                                     |                                                                                                                                                         | Site Location: Finisklin                                                 |                 |                                                                                                                                                                                                                         |              |
| SUBSURFACE CONDITIONS                           |                                                                                     |                                                                                                                                                         |                                                                          |                 | SAMPLE                                                                                                                                                                                                                  |              |
| Depth<br>(mbgl)                                 | SYMBOL                                                                              | DESCRIPTION                                                                                                                                             | COMMENTS                                                                 | WATER<br>(mbgl) | Depth<br>(mbgl)                                                                                                                                                                                                         | PID<br>(ppm) |
| 0                                               |   | MADEGROUND.<br>Firm brown/ black slightly sandy slightly gravelly CLAY with some cobbles. Gravel and cobbles of limestone, brick, concrete and plastic. | 0.6 - 1.9 mbgl: Some brick, concrete, rope, pvc pipes and tyres.         |                 |                                                                                                                                                                                                                         |              |
| 1                                               |                                                                                     |                                                                                                                                                         |                                                                          |                 |                                                                                                                                                                                                                         |              |
| 2                                               |  | MADEGROUND (Waste).<br>Mixed highly decomposed waste with black sandy gravel matrix. Damp.                                                              | 1.9 - 4.8 mbgl: Plastic, paper, rope, pvc pipe, metal and glass bottles. |                 | 2.0                                                                                                                                                                                                                     | 0            |
| 3                                               |                                                                                     |                                                                                                                                                         |                                                                          |                 |                                                                                                                                                                                                                         |              |
| 4                                               |  |                                                                                                                                                         |                                                                          |                 | 4.0                                                                                                                                                                                                                     | 0            |
| 5                                               |                                                                                     |                                                                                                                                                         |                                                                          |                 |                                                                                                                                                                                                                         |              |
|                                                 |                                                                                     | End of trial pit - 4.8 mbgl.                                                                                                                            |                                                                          |                 |                                                                                                                                                                                                                         |              |
| Excavation Date: 17/06/09                       |                                                                                     |                                                                                                                                                         | Reference Datum: maOD                                                    |                 | Water Strike: NA                                                                                                                                                                                                        |              |
| Excavation Method: Tracked Mechanical Excavator |                                                                                     |                                                                                                                                                         | Elevation: NA                                                            |                 | Strike:  Level:                               |              |
| Excavated By: John Donlon Plant Hire            |                                                                                     |                                                                                                                                                         | Easting: 167999.084                                                      |                 | Revision: Final                                                                                                                                                                                                         |              |
| Logged By: CC                                   |                                                                                     |                                                                                                                                                         | Northing: 336907.212                                                     |                 | Page 1 of 1                                                                                                                                                                                                             |              |
| Checked By: EB                                  |                                                                                     |                                                                                                                                                         |                                                                          |                 |                                                                                                                                                                                                                         |              |

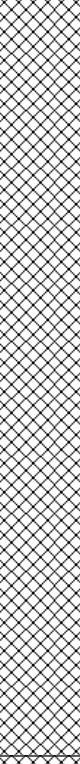
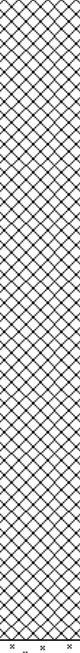
| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                      |                                                                                                                                                                   |              |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br>MALONE O'REGAN<br>ENVIRONMENTAL SERVICES LTD. |           |
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| Project Number: E0715                   |                                                                                     | Client: Sligo County Council                                                                                                                         |                                                                                                                                                                   |              | TRIAL PIT NO: TP21                                                                                                                                                                       |           |
| Project Title: Environmental Assessment |                                                                                     | Site Location: Finisklin                                                                                                                             |                                                                                                                                                                   |              |                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                      |                                                                                                                                                                   |              | SAMPLE                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                          | COMMENTS                                                                                                                                                          | WATER (mbgl) | Depth (mbgl)                                                                                                                                                                             | PID (ppm) |
| 0                                       |    | MADEGROUND.<br>Soft brown slightly sandy slightly gravelly CLAY with some C&D waste. Dry.                                                            | 0.0 - 0.4 mbgl: Some brick and timber.                                                                                                                            |              |                                                                                                                                                                                          |           |
|                                         |                                                                                     | MADEGROUND.<br>Soft brown slightly sandy gravelly CLAY with some cobbles and boulders. Much mixed waste with occasional lenses of sandy gravel. Dry. | 0.4 - 1.35 mbgl: Much timber, wire, large concrete slabs with some brick, rope and plastic. Some black mottling.                                                  |              |                                                                                                                                                                                          |           |
| 1                                       |   | MADEGROUND.<br>Mixed moderate to highly decomposed commercial/ industrial waste with some black gravelly sand matrix.                                | 1.35 - 2.5 mbgl: Plastic sacks of shredded paper, bags of plastic wire, aeroboard, with some ashy pockets. Occasional rope, metal wire and bales of plastic bags. |              |                                                                                                                                                                                          |           |
| 2                                       |                                                                                     | MADEGROUND (Municipal waste).<br>Mixed highly decomposed municipal/ domestic waste.                                                                  | 2.5 - 4.5 mbgl: Refuse sacks with decomposed waste, glass bottles, food wrappers.                                                                                 |              |                                                                                                                                                                                          |           |
| 3                                       |  |                                                                                                                                                      | 3.5 mbgl: Some tyres and metal. Hydrocarbon sheen and slight hydrocarbon odour.                                                                                   |              |                                                                                                                                                                                          |           |
| 4                                       |                                                                                     |                                                                                                                                                      |                                                                                                                                                                   |              |                                                                                                                                                                                          |           |
|                                         |  | Soft black slightly gravelly silty SAND.<br>Gravel is of limestone and shells. Damp.                                                                 |                                                                                                                                                                   |              | 3.9                                                                                                                                                                                      | 3.6       |
|                                         |                                                                                     | End of trial pit - 4.8 mbgl.                                                                                                                         |                                                                                                                                                                   |              | 4.6                                                                                                                                                                                      | 4.7       |
| 5                                       |                                                                                     |                                                                                                                                                      |                                                                                                                                                                   |              |                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 3.9 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167910.861   |                                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 336945.349  | Revision: Final                                                                                                                                                                            |
| Checked By: EB                                  |                       | Page 1 of 1                                                                                                                                                                                |

| TRIAL PIT LOG                           |                                                                                    |                                                                                                                                         |                                                                                                                                           |                     |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |           |
|-----------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                    |                                                                                                                                         | Client: Sligo County Council                                                                                                              |                     | TRIAL PIT NO: TP22                                                                                                                                                                                       |           |
| Project Title: Environmental Assessment |                                                                                    |                                                                                                                                         | Site Location: Finisklin                                                                                                                  |                     |                                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                    |                                                                                                                                         |                                                                                                                                           |                     | SAMPLE                                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                             | DESCRIPTION                                                                                                                             | COMMENTS                                                                                                                                  | WATER (mbgl)        | Depth (mbgl)                                                                                                                                                                                             | PID (ppm) |
| 0                                       |   | MADEGROUND.<br>Hardcore. Clayey SAND. Dry.                                                                                              | 0.2 - 1.0 mbgl: Much brick and blocks.                                                                                                    |                     | 0.9                                                                                                                                                                                                      | 3.1       |
|                                         |                                                                                    | MADEGROUND (C&D waste).<br>Black/ brown slightly clayey gravelly SAND with many cobbles. Cobbles are of limestone. Much C&D waste. Dry. |                                                                                                                                           |                     |                                                                                                                                                                                                          |           |
| 1                                       |                                                                                    | MADEGROUND.<br>Mixed highly decomposed waste with black sandy gravel waste.                                                             |                                                                                                                                           |                     |                                                                                                                                                                                                          |           |
| 2                                       |  |                                                                                                                                         | 1.0 - 4.1 mbgl: Mixed waste of plastic with some chipwood, blocks, glass, timber, rubber, pvc pipe , newspaper (6th June 1979) and brick. | 4 3.8 mbgl: Seepage | 3.0                                                                                                                                                                                                      | 6.7       |
|                                         |                                                                                    |                                                                                                                                         | 2.5 mbgl: Some tyres.                                                                                                                     |                     |                                                                                                                                                                                                          |           |
| 3                                       |                                                                                    |                                                                                                                                         |                                                                                                                                           |                     |                                                                                                                                                                                                          |           |
| 4                                       |                                                                                    |                                                                                                                                         |                                                                                                                                           |                     |                                                                                                                                                                                                          |           |
| 5                                       |                                                                                    |                                                                                                                                         |                                                                                                                                           |                     |                                                                                                                                                                                                          |           |
|                                         |                                                                                    | End of trial pit - 4.1 mbgl.                                                                                                            |                                                                                                                                           |                     |                                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 3.8 mbgl                                                                                                                                                                     |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 167994.601   | Revision: Final Page 1 of 1                                                                                                                                                                |
| Logged By: CC                                   | Northing: 336954.401  |                                                                                                                                                                                            |
| Checked By: EB                                  |                       |                                                                                                                                                                                            |



| TRIAL PIT LOG                           |                                                                                     |                                                                                                                                                                                    |                                                                          |                                        |  2B Richview Office Park,<br>Clonskeagh,<br>Dublin 14<br><small>MALONE O'REGAN<br/>ENVIRONMENTAL SERVICES LTD.</small> |           |
|-----------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Project Number: E0715                   |                                                                                     |                                                                                                                                                                                    | Client: Sligo County Council                                             |                                        | TRIAL PIT NO: TP23                                                                                                                                                                                       |           |
| Project Title: Environmental Assessment |                                                                                     |                                                                                                                                                                                    | Site Location: Finisklin                                                 |                                        |                                                                                                                                                                                                          |           |
| SUBSURFACE CONDITIONS                   |                                                                                     |                                                                                                                                                                                    |                                                                          |                                        | SAMPLE                                                                                                                                                                                                   |           |
| Depth (mbgl)                            | SYMBOL                                                                              | DESCRIPTION                                                                                                                                                                        | COMMENTS                                                                 | WATER (mbgl)                           | Depth (mbgl)                                                                                                                                                                                             | PID (ppm) |
| 0                                       |    | MADEGROUND (Hardcore). GRAVEL.                                                                                                                                                     | 0.25 - 1.0 mbgl: Some metal wire pipes.                                  |                                        |                                                                                                                                                                                                          |           |
|                                         |                                                                                     | MADEGROUND (C&D waste). Waste with soft brown/ grey slightly sandy gravel with many cobbles and boulders. Gravel, cobbles and boulders are of limestone, brick and concrete. Damp. |                                                                          |                                        |                                                                                                                                                                                                          |           |
| 1                                       |   |                                                                                                                                                                                    | 2.6 - 4.6 mbgl: Degraded waste with plastic bottles and food containers. | 2.6 mbgl: Seepage<br>4.7 mbgl: Seepage |                                                                                                                                                                                                          |           |
|                                         |                                                                                     | MADEGROUND (Municipal waste). Mixed highly decomposed waste with slight sandy clay/silt matrix. Waste as lenses of sandy gravel with identifiable food containers.                 |                                                                          |                                        |                                                                                                                                                                                                          |           |
| 2                                       |  |                                                                                                                                                                                    |                                                                          |                                        |                                                                                                                                                                                                          |           |
|                                         |                                                                                     |                                                                                                                                                                                    |                                                                          |                                        |                                                                                                                                                                                                          |           |
| 3                                       |  |                                                                                                                                                                                    |                                                                          |                                        |                                                                                                                                                                                                          |           |
|                                         |                                                                                     | Soft grey/ black slightly gravelly sandy SILT.                                                                                                                                     |                                                                          |                                        |                                                                                                                                                                                                          |           |
| 4                                       |  |                                                                                                                                                                                    |                                                                          |                                        |                                                                                                                                                                                                          |           |
|                                         |                                                                                     | End of trial pit - 4.9 mbgl.                                                                                                                                                       |                                                                          |                                        |                                                                                                                                                                                                          |           |
| 5                                       |                                                                                     |                                                                                                                                                                                    |                                                                          |                                        |                                                                                                                                                                                                          |           |

|                                                 |                       |                                                                                                                                                                                            |
|-------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation Date: 17/06/09                       | Reference Datum: maOD | Water Strike: 2.6 mbgl & 4.7 mbgl                                                                                                                                                          |
| Excavation Method: Tracked Mechanical Excavator | Elevation: NA         | Strike:  Level:  |
| Excavated By: John Donlon Plant Hire            | Easting: 168080.498   |                                                                                                                                                                                            |
| Logged By: CC                                   | Northing: 336827.825  | Revision: Final                                                                                                                                                                            |
| Checked By: EB                                  |                       | Page 1 of 1                                                                                                                                                                                |

# APPENDIX G

EOHS/OS

| CHAIN OF CUSTODY                                                                              |           |        |          |      |                 |              |                                                                             |  |  | Jones Environmental Laboratory.         |  |
|-----------------------------------------------------------------------------------------------|-----------|--------|----------|------|-----------------|--------------|-----------------------------------------------------------------------------|--|--|-----------------------------------------|--|
| CLIENT: MACONE ORGANICS                                                                       |           |        |          |      |                 |              |                                                                             |  |  | SAMPLER: CC                             |  |
| ADDRESS: 26 RIVERVIEW OFFICE PK                                                               |           |        |          |      |                 |              |                                                                             |  |  | MOBILE:                                 |  |
| CONSULTANT: JUNE 14                                                                           |           |        |          |      |                 |              |                                                                             |  |  | EMAIL REPORT TO: phark@macone.ie        |  |
| PROJECT MANAGER (PM): ELANOR BURKE                                                            |           |        |          |      |                 |              |                                                                             |  |  | cc REPORT TO:                           |  |
| MOBILE:                                                                                       |           |        |          |      |                 |              |                                                                             |  |  | INVOICE TO: (if different to report)    |  |
| PROJECT ID: EO715                                                                             |           |        |          |      |                 |              |                                                                             |  |  | QUOTE NUMBER:                           |  |
| SITE: SUGO                                                                                    |           |        |          |      |                 |              |                                                                             |  |  | P.O No: EO715                           |  |
| TURNAROUND - please tick                                                                      |           |        |          |      |                 |              |                                                                             |  |  | ANALYSIS REQUIRED including SUITE names |  |
| 10 DAY <input type="checkbox"/> 4 DAY <input type="checkbox"/> Other <input type="checkbox"/> |           |        |          |      |                 |              |                                                                             |  |  |                                         |  |
| 5 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>                                 |           |        |          |      |                 |              |                                                                             |  |  |                                         |  |
| FOR LABORATORY USE ONLY                                                                       |           |        |          |      |                 |              |                                                                             |  |  |                                         |  |
| AVERAGE COOL BOX TEMP (if required):                                                          |           |        |          |      |                 |              |                                                                             |  |  |                                         |  |
| SAMPLE RECEIPT CONDITION:                                                                     |           |        |          |      |                 |              |                                                                             |  |  |                                         |  |
| SAMPLE INFORMATION (note: S = Soil, W=Water, P=Product/oil)                                   |           |        |          |      |                 |              |                                                                             |  |  |                                         |  |
| Lab ID                                                                                        | Sample ID | Matrix | Date     | Time | Depth in Metres | Preservation |                                                                             |  |  |                                         |  |
| TP 10                                                                                         | 2.1       | S      | 16/06/09 |      | 3.7             |              | ANALYSIS REQUIRED including SUITE names<br>ALL SAMPLES ON HOLD FOR ANALYSIS |  |  |                                         |  |
| TP 11                                                                                         | 2.1       | S      | 16/06/09 |      | 3.7             |              |                                                                             |  |  |                                         |  |
| TP 12                                                                                         | 4.8       | S      | 16/06/09 |      | 4.8             |              |                                                                             |  |  |                                         |  |
| TP 13                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 14                                                                                         | 3.7       | S      | 16/06/09 |      | 3.7             |              |                                                                             |  |  |                                         |  |
| TP 15                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 16                                                                                         | 4.1       | S      | 16/06/09 |      | 4.1             |              |                                                                             |  |  |                                         |  |
| TP 17                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 18                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 19                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 20                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 21                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 22                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 23                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 24                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 25                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 26                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 27                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 28                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 29                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 30                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 31                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 32                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 33                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 34                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 35                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 36                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 37                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 38                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 39                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 40                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 41                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 42                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 43                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 44                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 45                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 46                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 47                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 48                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 49                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 50                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 51                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 52                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 53                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 54                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 55                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 56                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 57                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 58                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 59                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 60                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 61                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 62                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 63                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 64                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 65                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 66                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 67                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 68                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 69                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 70                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 71                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 72                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 73                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 74                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 75                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 76                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 77                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 78                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 79                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 80                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 81                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 82                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 83                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 84                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 85                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 86                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 87                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 88                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 89                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 90                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 91                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 92                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 93                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 94                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 95                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 96                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 97                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 98                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 99                                                                                         | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 100                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 101                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 102                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 103                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 104                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 105                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 106                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 107                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 108                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 109                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 110                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 111                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 112                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 113                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 114                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 115                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 116                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 117                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 118                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 119                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 120                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 121                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 122                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 123                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 124                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 125                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 126                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 127                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 128                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 129                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 130                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 131                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 132                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 133                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 134                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 135                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 136                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 137                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 138                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 139                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 140                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 141                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 142                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 143                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 144                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 145                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 146                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 147                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 148                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 149                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 150                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 151                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 152                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 153                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 154                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 155                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 156                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 157                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 158                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 159                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 160                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 161                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 162                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 163                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 164                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 165                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 166                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 167                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 168                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 169                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 170                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 171                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 172                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 173                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 174                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 175                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 176                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 177                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 178                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 179                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 180                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 181                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 182                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 183                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 184                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 185                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 186                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 187                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 188                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 189                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 190                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 191                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 192                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 193                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 194                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 195                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 196                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 197                                                                                        | 3.0       | S      | 16/06/09 |      | 3.0             |              |                                                                             |  |  |                                         |  |
| TP 198                                                                                        | 3.0       | S      | 16/06/09 |      |                 |              |                                                                             |  |  |                                         |  |



## Jones Environmental Forensics Ltd

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Malone O'Regan  
2b Richview Office Park  
Clonskeagh  
Dublin 14



Attention: Eleanor Burke

|                               |                     |
|-------------------------------|---------------------|
| <b>Date:</b>                  | 6th July 2009       |
| <b>Your reference:</b>        | E0715               |
| <b>Our reference :</b>        | Test Report 09/1738 |
| <b>Location :</b>             | Sligo               |
| <b>Date samples received:</b> | 20th June 2009      |
| <b>Status:</b>                | Final Report        |
| <b>Issue:</b>                 | 1                   |

Fourteen soil samples were received for analysis on 23rd June 2009 which was completed on 6th July 2009. Please find attached our Test Report which should include all sections if reproduced. All interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Signed**

**J W Farrell- Jones CChem FRSC**  
**Chartered Chemist**

# Jones Environmental Laboratory

**Client Name:** Malone O'Regan

## Report - solids

**Reference:** E0715

**Location:** Sligo

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

**Contact:** Eleanor Burke

**JE Job No.:** 09/1738

| J E Sample No.                                  | 1-3      | 4-6      | 7-9        | 10-12                         | 13-15    | 16-18    | 19-21    | 22-24    | 25-26    | 27       | # UKAS Accredited |        |          |
|-------------------------------------------------|----------|----------|------------|-------------------------------|----------|----------|----------|----------|----------|----------|-------------------|--------|----------|
| Sample ID                                       | TP10     | TP11     | TP12       | TP5                           | TP4      | TP3      | TP8      | TP1      | TP7      | TP15     |                   |        |          |
| Depth                                           | 2.1      | 4.6      | 4.8        | 4.2                           | 3.7      | 2.5-3.0  | 3.0      | 4.1-4.9  | 3.5-3.9  | 3.4      |                   |        |          |
| Containers                                      | V & J    | V & J    | V & J      | V & J                         | V & J    | V & J    | V & J    | V & J    | V & J    | V        |                   |        |          |
| Sample Date                                     | 16/06/09 | 16/06/09 | 16/06/09   | 16/06/09                      | 16/06/09 | 16/06/09 | 16/06/09 | 16/06/09 | 16/06/09 | 17/06/09 |                   |        |          |
| Sample Type                                     | Soil     | Soil     | Soil       | Soil                          | Soil     | Soil     | Soil     | Soil     | Soil     | Soil     |                   |        |          |
| Batch Number                                    | 1        | 1        | 1          | 1                             | 1        | 1        | 1        | 1        | 1        | 1        |                   |        |          |
| Date of Receipt                                 | 20/06/09 | 20/06/09 | 20/06/09   | 20/06/09                      | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09 |                   |        |          |
|                                                 | LOD      | Units    | Method No. |                               |          |          |          |          |          |          |                   |        |          |
| DRO/EPH (C8-40)                                 | 1991     | ~        | ~          | 2345                          | ~        | 606      | ~        | ~        | 1752     | ~        | <30               | mg/ kg | TM5/PM8  |
| Mineral Oil C10-40 (Interpretation/calculation) | <30      | ~        | ~          | <30                           | ~        | <30      | ~        | ~        | <30      | ~        | <30               | mg/ kg | TM5/PM8  |
| Benzene #                                       | 8        | ~        | ~          | <2                            | ~        | <2       | ~        | ~        | <2       | ~        | <2                | µg/ kg | TM2/PM7  |
| Toluene #                                       | 278      | ~        | ~          | 4                             | ~        | 5        | ~        | ~        | <2       | ~        | <2                | µg/ kg | TM2/PM7  |
| Ethyl benzene #                                 | 20       | ~        | ~          | 8                             | ~        | <2       | ~        | ~        | 3        | ~        | <2                | µg/ kg | TM2/PM7  |
| m/p-Xylene #                                    | 191      | ~        | ~          | 76                            | ~        | 51       | ~        | ~        | 12       | ~        | <4                | µg/ kg | TM2/PM7  |
| o-Xylene#                                       | 118      | ~        | ~          | 54                            | ~        | 14       | ~        | ~        | 3        | ~        | <2                | µg/ kg | TM2/PM7  |
| Total BTEX #                                    | 615      | ~        | ~          | 142                           | ~        | 70       | ~        | ~        | 18       | ~        | <12               | µg/ kg | TM2/PM7  |
| MTBE #                                          | <4       | ~        | ~          | <4                            | ~        | <4       | ~        | ~        | <4       | ~        | <4                | µg/ kg | TM2/PM7  |
| PCB 28                                          | 69       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB 52                                          | 13       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB 101                                         | <5       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB 118                                         | <5       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB 138                                         | <5       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB 153                                         | <5       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB 180                                         | <5       | ~        | ~          | <25                           | ~        | <5       | ~        | ~        | <5       | ~        | <5                | µg/ kg | TM17/PM8 |
| PCB (Total 7 congeners)                         | 82       | ~        | ~          | <175                          | ~        | <35      | ~        | ~        | <35      | ~        | <35               | µg/ kg | TM17/PM8 |
| TOC                                             | 2.1      | ~        | ~          | 11.1                          | ~        | 4.2      | ~        | ~        | 9.4      | ~        | <0.2              | %      | TM021    |
|                                                 |          |          |            |                               |          |          |          |          |          |          |                   |        |          |
| GRO (C4-12)                                     |          |          |            |                               |          |          |          |          |          |          |                   |        |          |
| GRO (C4-C8)                                     | 1282     | ~        | ~          | <100                          | ~        | 215      | ~        | ~        | <100     | ~        | <100              | µg/kg  | TM3/PM12 |
| GRO (C8-C12)                                    | 46659    | ~        | ~          | 13978                         | ~        | 3670     | ~        | ~        | 615      | ~        | <100              | µg/kg  | TM3/PM12 |
| GRO (C4-12)                                     | 47941    | ~        | ~          | 13978                         | ~        | 3885     | ~        | ~        | 615      | ~        | <100              | µg/kg  | TM3/PM12 |
|                                                 |          |          |            |                               |          |          |          |          |          |          |                   |        |          |
|                                                 | sample   | ID       | Depth      | EPH/DRO Interpretations       |          |          |          |          |          |          |                   |        |          |
| Interpretation                                  | 1-3      | TP10     | 2.1        | Naturally occurring compounds |          |          |          |          |          |          |                   |        |          |
| Interpretation                                  | 10-12    | TP5      | 4.2        | Naturally occurring compounds |          |          |          |          |          |          |                   |        |          |
| Interpretation                                  | 16-18    | TP3      | 2.5-3.0    | Naturally occurring compounds |          |          |          |          |          |          |                   |        |          |
| Interpretation                                  | 25-26    | TP7      | 3.5-3.9    | Naturally occurring compounds |          |          |          |          |          |          |                   |        |          |
|                                                 |          |          |            |                               |          |          |          |          |          |          |                   |        |          |



# Jones Environmental Laboratory

**Client Name:** Malone O'Regan

**Reference:** E0715

**Location:** Sligo

**Contact:** Eleanor Burke

**JE Job No.:** 09/1738

## Report - solids

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

| J E Sample No.          | 1-3      | 4-6      | 7-9      | 10-12       | 13-15    | 16-18    | 19-21    | 22-24    | 25-26    | 27       | # UKAS Accredited |              |                |
|-------------------------|----------|----------|----------|-------------|----------|----------|----------|----------|----------|----------|-------------------|--------------|----------------|
| Sample ID               | TP10     | TP11     | TP12     | TP5         | TP4      | TP3      | TP8      | TP1      | TP7      | TP15     |                   |              |                |
| Depth                   | 2.1      | 4.6      | 4.8      | 4.2         | 3.7      | 2.5-3.0  | 3.0      | 4.1-4.9  | 3.5-3.9  | 3.4      |                   |              |                |
| Containers              | V & J    | V & J    | V & J    | V & J       | V & J    | V & J    | V & J    | V & J    | V & J    | V        |                   |              |                |
| Sample Date             | 16/06/09 | 16/06/09 | 16/06/09 | 16/06/09    | 16/06/09 | 16/06/09 | 16/06/09 | 16/06/09 | 16/06/09 | 17/06/09 |                   |              |                |
| Sample Type             | Soil     | Soil     | Soil     | Soil        | Soil     | Soil     | Soil     | Soil     | Soil     | Soil     |                   |              |                |
| Batch Number            | 1        | 1        | 1        | 1           | 1        | 1        | 1        | 1        | 1        | 1        |                   |              |                |
| Date of Receipt         | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09    | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09 | LOD               | Units        | Method         |
| <b>PAH 6 Total</b>      |          |          |          |             |          |          |          |          |          |          |                   |              |                |
| Fluoranthene #          | 0.41     | ~        | ~        | 0.47        | ~        | 0.21     | ~        | ~        | 0.53     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Benzo(bk)fluoranthene # | 0.43     | ~        | ~        | 0.71        | ~        | 0.35     | ~        | ~        | 0.61     | ~        | <0.04             | mg/kg        | TM4/PM8        |
| Benzo(a)pyrene #        | 0.26     | ~        | ~        | 0.38        | ~        | 0.16     | ~        | ~        | 0.41     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Indeno(123cd)pyrene #   | 0.20     | ~        | ~        | 0.28        | ~        | 0.18     | ~        | ~        | 0.30     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Benzo(ghi)perylene #    | 0.18     | ~        | ~        | 0.28        | ~        | 0.16     | ~        | ~        | 0.31     | ~        | <0.04             | mg/kg        | TM4/PM8        |
| <b>PAH 6 Total</b>      | 1.48     | ~        | ~        | 2.12        | ~        | 1.06     | ~        | ~        | 2.16     | ~        | <b>&lt;0.07</b>   | <b>mg/kg</b> | <b>TM4/PM8</b> |
| <b>PAH 16</b>           |          |          |          | x5 dilution |          |          |          |          |          |          |                   |              |                |
| Naphthalene #           | <0.03    | ~        | ~        | <0.15       | ~        | <0.03    | ~        | ~        | <0.03    | ~        | <0.03             | mg/kg        | TM4/PM8        |
| Acenaphthylene          | 0.08     | ~        | ~        | <0.10       | ~        | <0.02    | ~        | ~        | 0.10     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Acenaphthene #          | 0.08     | ~        | ~        | <0.10       | ~        | <0.02    | ~        | ~        | <0.02    | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Fluorene #              | 0.08     | ~        | ~        | <0.10       | ~        | <0.02    | ~        | ~        | 0.06     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Phenanthrene #          | 0.26     | ~        | ~        | 0.34        | ~        | 0.18     | ~        | ~        | 0.21     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Anthracene #            | 0.08     | ~        | ~        | <0.10       | ~        | <0.02    | ~        | ~        | 0.07     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Fluoranthene #          | 0.41     | ~        | ~        | 0.47        | ~        | 0.21     | ~        | ~        | 0.53     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Pyrene #                | 0.34     | ~        | ~        | 0.40        | ~        | 0.19     | ~        | ~        | 0.50     | ~        | <0.03             | mg/kg        | TM4/PM8        |
| Benz(a)anthracene #     | 0.30     | ~        | ~        | 0.52        | ~        | 0.25     | ~        | ~        | 0.40     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Chrysene #              | 0.22     | ~        | ~        | 0.39        | ~        | 0.19     | ~        | ~        | 0.38     | ~        | <0.04             | mg/kg        | TM4/PM8        |
| Benzo(bk)fluoranthene # | 0.43     | ~        | ~        | 0.71        | ~        | 0.35     | ~        | ~        | 0.61     | ~        | <0.04             | mg/kg        | TM4/PM8        |
| Benzo(a)pyrene #        | 0.26     | ~        | ~        | 0.38        | ~        | 0.16     | ~        | ~        | 0.41     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Indeno(123cd)pyrene #   | 0.20     | ~        | ~        | 0.28        | ~        | 0.18     | ~        | ~        | 0.30     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Dibenzo(ah)anthracene # | 0.08     | ~        | ~        | <0.10       | ~        | <0.02    | ~        | ~        | <0.02    | ~        | <0.02             | mg/kg        | TM4/PM8        |
| Benzo(ghi)perylene #    | 0.18     | ~        | ~        | 0.28        | ~        | 0.16     | ~        | ~        | 0.31     | ~        | <0.04             | mg/kg        | TM4/PM8        |
| <b>PAH 16 Total</b>     | 3.00     | ~        | ~        | 3.77        | ~        | 1.87     | ~        | ~        | 3.88     | ~        | <b>&lt;0.38</b>   | <b>mg/kg</b> | <b>TM4/PM8</b> |
| Coronene                | <0.02    | ~        | ~        | <0.10       | ~        | 0.05     | ~        | ~        | 0.12     | ~        | <0.02             | mg/kg        | TM4/PM8        |
| <b>PAH 17 Total</b>     | 3.00     | ~        | ~        | 3.77        | ~        | 1.92     | ~        | ~        | 4.00     | ~        | <b>&lt;0.40</b>   | <b>mg/kg</b> | <b>TM4/PM8</b> |

***Client Name:*** Malone O'Regan  
***Reference:*** E0715  
***Location:*** Sligo  
***Contact:*** Eleanor Burke  
***JE Job No.:*** 09/1738

**Solids:** V=60g VOC jar. J=250g glass jar. T=plastic tub

QF-PM 3.1 v3

# **Jones Environmental Laboratory**

**Client Name:** Malone O'Regan

**Reference:** E0715

**Location:** Sligo

**Contact:** Eleanor Burke

**JE Job No.:** 09/1738

## **Report - solids**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

| J E Sample No.                                     | 28       | 29-30    | 31-32    | 33-34                         |  |  |  |  |  |  |                   |        |            |
|----------------------------------------------------|----------|----------|----------|-------------------------------|--|--|--|--|--|--|-------------------|--------|------------|
| Sample ID                                          | TP13     | TP16     | BH18     | BH16                          |  |  |  |  |  |  |                   |        |            |
| Depth                                              | 3.9-4.2  | 3.0-4.0  | 1.05-1.2 | 1.3-1.6                       |  |  |  |  |  |  |                   |        |            |
| Containers                                         | V        | V & J    | V & J    | V & J                         |  |  |  |  |  |  |                   |        |            |
| Sample Date                                        | 17/06/09 | 17/06/09 | 17/06/09 | 17/06/09                      |  |  |  |  |  |  |                   |        |            |
| Sample Type                                        | Soil     | Soil     | Soil     | Soil                          |  |  |  |  |  |  |                   |        |            |
| Batch Number                                       | 1        | 1        | 1        | 1                             |  |  |  |  |  |  |                   |        |            |
| Date of Receipt                                    | 20/06/09 | 20/06/09 | 20/06/09 | 20/06/09                      |  |  |  |  |  |  |                   |        |            |
|                                                    |          |          |          |                               |  |  |  |  |  |  | # UKAS Accredited |        |            |
|                                                    |          |          |          |                               |  |  |  |  |  |  | LOD               | Units  | Method No. |
| DRO/EPH (C8-40)                                    | ~        | 799      | ~        | ~                             |  |  |  |  |  |  | <30               | mg/ kg | TM5/PM8    |
| Mineral Oil C10-40<br>(Interpretation/calculation) | ~        | <30      | ~        | ~                             |  |  |  |  |  |  | <30               | mg/ kg | TM5/PM8    |
| Benzene #                                          | ~        | <2       | ~        | ~                             |  |  |  |  |  |  | <2                | µg/ kg | TM2/PM7    |
| Toluene #                                          | ~        | <2       | ~        | ~                             |  |  |  |  |  |  | <2                | µg/ kg | TM2/PM7    |
| Ethyl benzene #                                    | ~        | <2       | ~        | ~                             |  |  |  |  |  |  | <2                | µg/ kg | TM2/PM7    |
| m/p-Xylene #                                       | ~        | <4       | ~        | ~                             |  |  |  |  |  |  | <4                | µg/ kg | TM2/PM7    |
| o-Xylene #                                         | ~        | <2       | ~        | ~                             |  |  |  |  |  |  | <2                | µg/ kg | TM2/PM7    |
| Total BTEX #                                       | ~        | <12      | ~        | ~                             |  |  |  |  |  |  | <12               | µg/ kg | TM2/PM7    |
| MTBE #                                             | ~        | <4       | ~        | ~                             |  |  |  |  |  |  | <4                | µg/ kg | TM2/PM7    |
| PCB 28                                             | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB 52                                             | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB 101                                            | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB 118                                            | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB 138                                            | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB 153                                            | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB 180                                            | ~        | <5       | ~        | ~                             |  |  |  |  |  |  | <5                | µg/ kg | TM17/PM8   |
| PCB (Total 7 congeners)                            | ~        | <35      | ~        | ~                             |  |  |  |  |  |  | <35               | µg/ kg | TM17/PM8   |
| TOC                                                | ~        | 8.8      | ~        | ~                             |  |  |  |  |  |  | <0.2              | %      | TM021      |
| GRO (C4-12)                                        |          |          |          |                               |  |  |  |  |  |  |                   |        |            |
| GRO (C4-C8)                                        | ~        | 116      | ~        | ~                             |  |  |  |  |  |  | <100              | µg/kg  | TM3/PM12   |
| GRO (C8-C12)                                       | ~        | 364      | ~        | ~                             |  |  |  |  |  |  | <100              | µg/kg  | TM3/PM12   |
| GRO (C4-12)                                        | ~        | 481      | ~        | ~                             |  |  |  |  |  |  | <100              | µg/kg  | TM3/PM12   |
|                                                    | sample   | ID       | Depth    | EPH/DRO Interpretations       |  |  |  |  |  |  |                   |        |            |
| Interpretation                                     | 29-30    | TP16     | 3.0-4.0  | Naturally occurring compounds |  |  |  |  |  |  |                   |        |            |
|                                                    |          |          |          |                               |  |  |  |  |  |  |                   |        |            |
|                                                    |          |          |          |                               |  |  |  |  |  |  |                   |        |            |
|                                                    |          |          |          |                               |  |  |  |  |  |  |                   |        |            |

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Sligo  
**Contact:** Eleanor Burke  
**JE Job No.:** 09/1738

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

# UKAS Accredited

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Sligo  
**Contact:** Eleanor Burke  
**JE Job No.:** 09/1738

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

|                    |   |        |   |   |  |  |  |  |  |  |        |       |       |
|--------------------|---|--------|---|---|--|--|--|--|--|--|--------|-------|-------|
| Arsenic            | ~ | 0.08   | ~ | ~ |  |  |  |  |  |  | <0.01  | mg/kg | TM30  |
| Barium             | ~ | 0.71   | ~ | ~ |  |  |  |  |  |  | <0.03  | mg/kg | TM30  |
| Cadmium            | ~ | <0.01  | ~ | ~ |  |  |  |  |  |  | <0.01  | mg/kg | TM30  |
| Chromium           | ~ | <0.02  | ~ | ~ |  |  |  |  |  |  | <0.02  | mg/kg | TM30  |
| Copper             | ~ | <0.12  | ~ | ~ |  |  |  |  |  |  | <0.12  | mg/kg | TM30  |
| Mercury            | ~ | <0.001 | ~ | ~ |  |  |  |  |  |  | <0.001 | mg/kg | TM30  |
| Molybdenum         | ~ | 0.39   | ~ | ~ |  |  |  |  |  |  | <0.05  | mg/kg | TM30  |
| Nickel             | ~ | <0.06  | ~ | ~ |  |  |  |  |  |  | <0.06  | mg/kg | TM30  |
| Lead               | ~ | <0.1   | ~ | ~ |  |  |  |  |  |  | <0.1   | mg/kg | TM30  |
| Antimony           | ~ | <0.03  | ~ | ~ |  |  |  |  |  |  | <0.03  | mg/kg | TM30  |
| Selenium           | ~ | <0.03  | ~ | ~ |  |  |  |  |  |  | <0.03  | mg/kg | TM30  |
| Zinc               | ~ | <0.04  | ~ | ~ |  |  |  |  |  |  | <0.04  | mg/kg | TM30  |
| Chloride           | ~ | 82     | ~ | ~ |  |  |  |  |  |  | <1     | mg/kg | TM38  |
| Fluoride           | ~ | <1     | ~ | ~ |  |  |  |  |  |  | <1     | mg/kg | TM38  |
| Sulphate (Soluble) | ~ | 695    | ~ | ~ |  |  |  |  |  |  | <1     | mg/kg | TM38  |
| Phenol             | ~ | <1     | ~ | ~ |  |  |  |  |  |  | <1     | mg/kg | TM26  |
| DOC                | ~ | 20     | ~ | ~ |  |  |  |  |  |  | <20    | mg/kg | TM060 |
| TDS                | ~ | 1540   | ~ | ~ |  |  |  |  |  |  | <400   | mg/kg | TM20  |



***Client Name:*** Malone O'Regan  
***Reference:*** E0715  
***Location:*** Sligo  
***Contact:*** Eleanor Burke  
***JE Job No.:*** 09/1738

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub  
**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
 H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HN0<sub>3</sub>

[illegible]

## APPENDIX H

| CHAIN OF CUSTODY                                                                                                                                                                                                                                                                     |           |                            |       |                                                              |                 |               |                    |                                      |     | <br><b>Jones Environmental Forensics Ltd.</b>                                      |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------|-------|--------------------------------------------------------------|-----------------|---------------|--------------------|--------------------------------------|-----|------------------------------------------------------------------------------------|----------|------------------|-----|---------------|----------|--------------------|---------------|---------------|--------------|---------------|--------------|----------------|--|
| CLIENT: <b>MALONE O' REGAN</b><br>ADDRESS: <b>2B Richview office PARK, (Constance) Dublin 14</b><br>PROJECT MANAGER (PM): <b>Eleanor Burke</b><br>MOBILE: <b>01 2602655</b><br>PROJECT ID: <b>E0715</b><br>SITE: <b>E0715</b>                                                        |           |                            |       |                                                              |                 |               |                    |                                      |     |                                                                                    |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| SAMPLER: <b>DOK / GOD</b>                                                                                                                                                                                                                                                            |           | MOBILE: <b>087 9554240</b> |       | EMAIL REPORT TO: <b>{Burke@morce.ie / CLIFFORD@morce.ie}</b> |                 | cc REPORT TO: |                    | INVOICE TO: (if different to report) |     | QUOTE NUMBER:                                                                      |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| P.O No:                                                                                                                                                                                                                                                                              |           |                            |       |                                                              |                 |               |                    |                                      |     | Chain of Custody sheet page <b>1</b> of <b>2</b>                                   |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| ANALYSIS REQUIRED including SUITE names<br>TDS    Ammonia (2)    TOC    Total Alkalinity (Ca)    Sulphate    Chloride    MRP    Total Cyanide    Alkalide    Trace Organic Sols    (Cadmium (T))    Magnesium (T)    Iron (TOTAL)    Manganese (T)    Chromium (T)    Copper (Total) |           |                            |       |                                                              |                 |               |                    |                                      |     | COMMENTS<br>Notes: e.g. Heavily contaminated samples<br>e.g. "High PAHs expected". |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| SAMPLE INFORMATION (note: S = Soil, W=Water, P=Product/oil)<br>Matrix    Date    Time    Depth in Metres    Preservation                                                                                                                                                             |           |                            |       |                                                              |                 |               |                    |                                      |     | MCERTS (UK soils only)<br>MCERTS report required    Yes / No                       |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| Lab ID                                                                                                                                                                                                                                                                               | Sample ID | Matrix                     | Date  | Time                                                         | Depth in Metres | Preservation  | TDS                | Ammonia (2)                          | TOC | Total Alkalinity (Ca)                                                              | Sulphate | Chloride         | MRP | Total Cyanide | Alkalide | Trace Organic Sols | (Cadmium (T)) | Magnesium (T) | Iron (TOTAL) | Manganese (T) | Chromium (T) | Copper (Total) |  |
| BH-1                                                                                                                                                                                                                                                                                 |           |                            | 25/05 |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| BH-2                                                                                                                                                                                                                                                                                 |           |                            | "     |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| BH-3                                                                                                                                                                                                                                                                                 |           |                            | "     |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| BH-4                                                                                                                                                                                                                                                                                 |           |                            | "     |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| BH-6                                                                                                                                                                                                                                                                                 |           |                            | "     |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| BH-10                                                                                                                                                                                                                                                                                |           |                            | "     |                                                              |                 |               | ON Hold            |                                      |     |                                                                                    |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| <del>BH-11</del>                                                                                                                                                                                                                                                                     |           |                            | "     |                                                              |                 |               | <del>ON Hold</del> |                                      |     |                                                                                    |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| BH-13                                                                                                                                                                                                                                                                                |           |                            | "     |                                                              |                 |               | ON Hold            |                                      |     |                                                                                    |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| BH-14                                                                                                                                                                                                                                                                                |           |                            | "     |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| BH-5                                                                                                                                                                                                                                                                                 |           |                            | "     |                                                              |                 |               | ON Hold            |                                      |     |                                                                                    |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| BH-11                                                                                                                                                                                                                                                                                |           |                            | "     |                                                              |                 |               | X                  | X                                    | X   | X                                                                                  | X        | X                | X   | X             | X        | X                  | X             | X             | X            | X             | X            | X              |  |
| RELINQUISHED BY: <b>DOK</b> Date: <b>25-6-09</b><br>Name: <b>SHANNON CLEMENTS</b>                                                                                                                                                                                                    |           |                            |       |                                                              |                 |               |                    |                                      |     | METHOD OF SHIPMENT<br>Consignment note No:                                         |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| Of: <b>MOR</b> Time: <b>15:30</b>                                                                                                                                                                                                                                                    |           |                            |       |                                                              |                 |               |                    |                                      |     | Date: <b>25-6-09</b> Time:                                                         |          |                  |     |               |          |                    |               |               |              |               |              |                |  |
| Health & Safety Instructions including known hazards (eg suspected asbestos)                                                                                                                                                                                                         |           |                            |       |                                                              |                 |               |                    |                                      |     |                                                                                    |          | Courier Company: |     |               |          |                    |               |               |              |               |              |                |  |

E0715/05

| CHAIN OF CUSTODY                                                                                                                        |           |        |         |      |                 |              |                |                 |              | Jones Environmental Forensics Ltd.                                 |                 |               |                   |                |                   |              |              |                 |              |                 |              |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|---------|------|-----------------|--------------|----------------|-----------------|--------------|--------------------------------------------------------------------|-----------------|---------------|-------------------|----------------|-------------------|--------------|--------------|-----------------|--------------|-----------------|--------------|
| CLIENT: MALONE O' Regan                                                                                                                 |           |        |         |      |                 |              |                |                 |              | SAMPLER: DOK / GOD                                                 |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| ADDRESS: 2B Richmond Office Park, Clonsilla                                                                                             |           |        |         |      |                 |              |                |                 |              | MOBILE: 087 9554240                                                |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| DUBLIN 14                                                                                                                               |           |        |         |      |                 |              |                |                 |              | EMAIL REPORT TO: E.Burke@marcl.ie                                  |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| PROJECT ID: E0715                                                                                                                       |           |        |         |      |                 |              |                |                 |              | cc REPORT TO:                                                      |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| PROJECT MANAGER (PM): Eleanor Burke                                                                                                     |           |        |         |      |                 |              |                |                 |              | INVOICE TO: (if different to report)                               |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| MOBILE: 01-2602655                                                                                                                      |           |        |         |      |                 |              |                |                 |              | QUOTE NUMBER:                                                      |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| SITE: E0715                                                                                                                             |           |        |         |      |                 |              |                |                 |              | P.O. No:                                                           |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| TURNAROUND - please tick                                                                                                                |           |        |         |      |                 |              |                |                 |              | ANALYSIS REQUIRED including SUITE names                            |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| 10 DAY <input checked="" type="checkbox"/> 4 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> Other <input type="checkbox"/> |           |        |         |      |                 |              |                |                 |              | Notes: e.g. Heavily contaminated samples e.g. "High PAHs expected" |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| SAMPLE INFORMATION (note: S = Soil, W = Water, P = Product/oil)                                                                         |           |        |         |      |                 |              |                |                 |              | MCERTS (UK soils only)                                             |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| Lab ID                                                                                                                                  | Sample ID | Matrix | Date    | Time | Depth in Metres | Preservation | Nickel (Total) | Cadmium (Total) | Lead (Total) | Zinc (Total)                                                       | Arsenic (Total) | Boron (Total) | Manganese (Total) | Sodium (Total) | Potassium (Total) | Atrazine     | Simazine     | Dichloromethane | Toluene      | Triethylbenzene | Xylenes      |
| BH-1                                                                                                                                    |           |        | 25-6-09 |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-2                                                                                                                                    |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-3                                                                                                                                    |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-4                                                                                                                                    |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-6                                                                                                                                    |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-10                                                                                                                                   |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| <del>BH-11</del>                                                                                                                        |           |        | -       |      |                 |              | <del>X</del>   | <del>X</del>    | <del>X</del> | <del>X</del>                                                       | <del>X</del>    | <del>X</del>  | <del>X</del>      | <del>X</del>   | <del>X</del>      | <del>X</del> | <del>X</del> | <del>X</del>    | <del>X</del> | <del>X</del>    | <del>X</del> |
| BH-13                                                                                                                                   |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-14                                                                                                                                   |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-5                                                                                                                                    |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| BH-11                                                                                                                                   |           |        | -       |      |                 |              | X              | X               | X            | X                                                                  | X               | X             | X                 | X              | X                 | X            | X            | X               | X            | X               | X            |
| RECEIVED BY: DOK                                                                                                                        |           |        |         |      |                 |              |                |                 |              | RECEIVED BY: SHANNON CLEMENTS                                      |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| Name: DOK                                                                                                                               |           |        |         |      |                 |              |                |                 |              | Name: SHANNON CLEMENTS                                             |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| Of: MOR                                                                                                                                 |           |        |         |      |                 |              |                |                 |              | Of: CLEMENTS ENVIRONMENTAL                                         |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| Date: 25-6-09                                                                                                                           |           |        |         |      |                 |              |                |                 |              | Date: 25-6-09                                                      |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| Time:                                                                                                                                   |           |        |         |      |                 |              |                |                 |              | Time:                                                              |                 |               |                   |                |                   |              |              |                 |              |                 |              |
| Health & Safety instructions including known hazards (eg suspected asbestos)                                                            |           |        |         |      |                 |              |                |                 |              | METHOD OF SHIPMENT                                                 |                 |               |                   |                |                   |              |              |                 |              |                 |              |
|                                                                                                                                         |           |        |         |      |                 |              |                |                 |              | Consignment note No:                                               |                 |               |                   |                |                   |              |              |                 |              |                 |              |
|                                                                                                                                         |           |        |         |      |                 |              |                |                 |              | Courier Company:                                                   |                 |               |                   |                |                   |              |              |                 |              |                 |              |

Jones Environmental Forensics Ltd.  
Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, CH5 2UA  
Tel: 0044 1244 833 780

E0715/05

| CHAIN OF CUSTODY                                                             |           |                                      |      |      |                 |              |                                                                       |  |  | <br>Jones Environmental Forensics Ltd. |  |
|------------------------------------------------------------------------------|-----------|--------------------------------------|------|------|-----------------|--------------|-----------------------------------------------------------------------|--|--|-------------------------------------------------------------------------------------------------------------------------|--|
| CLIENT: MALONE O' REGAN                                                      |           | SAMPLER: DOK / GOD                   |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| ADDRESS: 2B Richview Office PARK                                             |           | MOBILE: 087 9554240                  |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| PROJECT MANAGER (PM): CLONKEATH, DUBLIN 14                                   |           | EMAIL REPORT TO: EBURKE@MORCE.IE     |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| PROJECT MANAGER (PM): ELEANOR BURKE                                          |           | CC REPORT TO: DOKEEFE@MORCE.IE       |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| MOBILE: 01-2602655                                                           |           | INVOICE TO: (if different to report) |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| PROJECT ID: E0715                                                            |           | QUOTE NUMBER:                        |      |      |                 |              |                                                                       |  |  | Chain of Custody sheet page 1 of 1                                                                                      |  |
| SITE: E0715                                                                  |           | P.O. No:                             |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| ANALYSIS REQUIRED INCLUDING SUITE NAMES                                      |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| FOR LABORATORY USE ONLY                                                      |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| AVERAGE COOL BOX TEMP (if required):                                         |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| SAMPLE RECEIPT CONDITION:                                                    |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| SAMPLE INFORMATION (note: S = Soil, W=Water, P=Product/foil)                 |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| Lab ID                                                                       | Sample ID | Matrix                               | Date | Time | Depth in Metres | Preservation |                                                                       |  |  |                                                                                                                         |  |
| BH-1                                                                         |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-2                                                                         |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-3                                                                         |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-4                                                                         |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-6                                                                         |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-10                                                                        |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-11                                                                        |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-13                                                                        |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| BH-14                                                                        |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
|                                                                              |           |                                      |      |      |                 |              | Notes: e.g. Heavily contaminated samples<br>e.g. "High PAHs expected" |  |  |                                                                                                                         |  |
|                                                                              |           |                                      |      |      |                 |              | MCERTS (UK soils only)                                                |  |  |                                                                                                                         |  |
|                                                                              |           |                                      |      |      |                 |              | MCERTS report required Yes / No                                       |  |  |                                                                                                                         |  |
| RECEIVED BY: SHANNON CLEMENT                                                 |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| Name: SHANNON CLEMENT Date: 25-6-09                                          |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| Of: CLEMENT ENVIRONMENTAL Time:                                              |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| Health & Safety instructions including known hazards (eg suspected asbestos) |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |
| Samples BH6, BH10, BH11, BH13 + BH14 are possible Leachate.                  |           |                                      |      |      |                 |              |                                                                       |  |  |                                                                                                                         |  |

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Jones Environmental Forensics Ltd.



|                       |                                                 |                                      |                   |
|-----------------------|-------------------------------------------------|--------------------------------------|-------------------|
| CLIENT:               | MALONE O'REGAN                                  | SAMPLER:                             | DWR 1600          |
| ADDRESS:              | 28 Rickview Office Park<br>Clarksburg, DnBla 14 | MOBILE:                              | +352 87 954240    |
|                       |                                                 | EMAIL REPORT TO:                     | CC.LIFFORD@DWR.DC |
| PROJECT MANAGER (PM): | STEADLER DUKE                                   | CC REPORT TO:                        | DOK@DWR.DC        |
| MOBILES:              | +352 1 700 2655                                 | INVOICE TO: (if different to report) |                   |

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Environmental  
Laboratory.*

Chain of Custody sheet page ..... of .....

Notes: e.g. Heavily contaminated samples  
e.g. "High PAHs expected"

**NOTE:** If an MCERTS report is required this must be requested when samples are scheduled.

MEALS \* TOTAL:  
 Calcium Magnesium Iron  
 Manganese Cobalt Copper  
 Copper Nickel Lead Zinc  
 Biotin Molybdenum Selenium  
 Chromium

Tree (dark) 100  
- SVOCs + Tics  
- VOCs + Tics

|       |  |         |  |          |  |         |  |                      |  |
|-------|--|---------|--|----------|--|---------|--|----------------------|--|
| Name: |  | Date:   |  | Name:    |  | Date:   |  | Consignment note No: |  |
| 000   |  | 16/7/06 |  | S. Clark |  | 16/7/07 |  |                      |  |
| Ot:   |  | Time:   |  | Of:      |  | Time:   |  | Courier Company:     |  |
| 0008  |  | 3m      |  |          |  | 515     |  |                      |  |

Health &amp; Safety instructions including known hazards (eg suspected asbestos)

Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, Flintshire CH5 2UA Tel: 01244 833 780

7000

# CHAIN OF CUSTODY

CLIENT: 11 Deeside    Q. Kennedy  
 ADDRESS: 11 Deeside    Richmond, Deeside, Flintshire  
 PROJECT MANAGER (PM): 11 Deeside    Richmond, Deeside, Flintshire  
 MOBILE: 11 Deeside    Richmond, Deeside, Flintshire  
 PROJECT ID: 11 Deeside    Richmond, Deeside, Flintshire  
 SITE: 11 Deeside    Richmond, Deeside, Flintshire

TURNAROUND - please tick  
 10 DAY ☒ 4 DAY ☐ 3 DAY ☐ Other ☐  
 5 DAY ☐

FOR LABORATORY USE ONLY  
 AVERAGE COOL BOX TEMP (if required):  
 SAMPLE RECEIPT CONDITION:

SAMPLE INFORMATION (note: S = Soil, W=Water, P=Product/oil)  
 Lab ID    Sample ID    Matrix    Date    Time    Depth in Metres    Preservation

|       |   |         |  |  |  |  |
|-------|---|---------|--|--|--|--|
| BH-1  | W | 16-7-09 |  |  |  |  |
| BH-2  | W | 16-7-09 |  |  |  |  |
| BH-3  | W | 16-7-09 |  |  |  |  |
| BH-4  | W | 16-7-09 |  |  |  |  |
| BH-5  | W | 16-7-09 |  |  |  |  |
| BH-6  | W | 16-7-09 |  |  |  |  |
| BH-10 | W | 16-7-09 |  |  |  |  |
| BH-11 | W | 16-7-09 |  |  |  |  |
| BH-12 | W | 16-7-09 |  |  |  |  |
| BH-14 | W | 16-7-09 |  |  |  |  |

RELINQUISHED BY: Name: DOK Date: 16-7-09  
 Of: MOR Time: 2pm

RECEIVED BY: Name: 11 Deeside Date: 16-7-09  
 Of: 11 Deeside Time: 1515

Health & Safety instructions including known hazards (eg suspected asbestos)



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 Environmental  
 Laboratory.

Chain of Custody sheet page 1 of 1

COMMENTS

Notes: e.g. Heavily contaminated samples

e.g. "High PAHs expected".

NOTE: If an MCERTS report is  
 required this must be requested when  
 samples are scheduled.

11 Deeside  
 11 Deeside  
 11 Deeside

METHOD OF SHIPMENT  
 Consignment note No:  
 Courier Company:

Jones Environmental Laboratory

Unit 3 Deeside Point, Zone 3 Deeside Industrial Park, Deeside, Flintshire CH5 2UA Tel: 01244 833 780

JEL 6998







## *Jones Environmental Forensics Ltd*

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

Tel: +44 (0) 1244 833780  
Fax: +44 (0) 1244 833781

Malone O'Regan  
2b Richview Office Park  
Clonskeagh  
Dublin 14



Attention: Eleanor Burke

|                               |                     |
|-------------------------------|---------------------|
| <b>Date:</b>                  | 21st April 2010     |
| <b>Your reference:</b>        | E0715               |
| <b>Our reference :</b>        | Test Report 09/1801 |
| <b>Location :</b>             | -                   |
| <b>Date samples received:</b> | 26th June 2009      |
| <b>Status:</b>                | Final Report        |
| <b>Issue:</b>                 | 2                   |

Ten water samples were received for analysis on 26th June 2009 which was completed on 9th July 2009. Please find attached our Test Report which should include all sections if reproduced. All interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Signed**

**J W Farrell- Jones CChem FRSC**  
**Chartered Chemist**



# **Jones Environmental Laboratory**

**Client Name:** Malone O'Regan

**Reference:** E0715

**Location:** -

**Contact:** Eleanor Burke

**JE Job No.:** 09/1801

## **Report - liquids**

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle

H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

| J E Sample No.                                     | 1-5      | 6-10     | 11-14    | 15-19    | 20-23    | 24-27    | 28-31    | 32-35    | 36-39    | 40       |                    |       |               |
|----------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------|-------|---------------|
| Sample ID                                          | BH1      | BH2      | BH3      | BH4      | BH6      | BH14     | BH10     | BH11     | BH13     | BH5      |                    |       |               |
| Depth                                              | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |                    |       |               |
| Containers                                         | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | P        | ND - None Detected |       |               |
| Sample Date                                        | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | ** Subcontracted   |       |               |
| Sample Type                                        | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    |                    |       |               |
| Batch Number                                       | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | # UKAS Accredited  |       |               |
| Date of Receipt                                    | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | LOD                | Units | Method No.    |
| VOCS (inc toluene, xylenes & dichloromethane)      | See tab  | See tab  | See tab  | See tab  | See tab  | See tab  | ~        | See tab  | ~        | ~        | <1-5               | µg/l  | TM15/PM10     |
| VOCS TICs (trace organics)                         | ND       | ND       | ND       | ND       | ND       | ND       | ~        | ND       | ~        | ~        | <100               | µg/l  | TM15/PM10     |
| SVOCs - trace organics                             | see tab  | see tab  | see tab  | see tab  | see tab  | see tab  | ~        | see tab  | ~        | ~        | <10                | µg/l  | TM16/PM9      |
| SVOC TICs (trace organics)                         | ND       | ND       | ND       | ND       | ND       | ND       | ~        | ND       | ~        | ~        | <100               | µg/l  | TM16/PM9      |
| Atrazine                                           | <1       | <1       | <1       | <1       | <1       | <1       | ~        | <1       | ~        | ~        | <1                 | µg/l  | TM39/PM9      |
| Simazine                                           | <1       | <1       | <1       | <1       | <1       | <1       | ~        | <1       | ~        | ~        | <1                 | µg/l  | TM39/PM9      |
| Sulphate <sup>#</sup>                              | 39.61    | 86.29    | 0.09     | 1.91     | 114.91   | 6.54     | ~        | 41.09    | ~        | ~        | <0.05              | mg/l  | TM038W        |
| Chloride <sup>#</sup>                              | 40.5     | 469.7    | 777.3    | 114.7    | 101.9    | 25.9     | ~        | 19.6     | ~        | ~        | <0.3               | mg/l  | TM038W        |
| Fluoride                                           | <0.3     | 0.4      | 0.6      | <0.3     | <0.3     | <0.3     | ~        | <0.3     | ~        | ~        | <0.3               | mg/l  | TM038W        |
| Ammonia as N                                       | <0.1     | 1.6      | 15.0     | 5.5      | 17.4     | 0.1      | ~        | 1.3      | ~        | ~        | <0.1               | mg/l  | TM053W        |
| Total Oxidised Nitrogen as N <sup>#</sup>          | 0.36     | <0.05    | <0.05    | 0.06     | <0.05    | <0.05    | ~        | 0.18     | ~        | ~        | <0.05              | mg/l  | TM038W        |
| Total Alkalinity as CaCO <sub>3</sub> <sup>#</sup> | 416      | 1364     | 1920     | 716      | ~        | ~        | ~        | ~        | ~        | ~        | <1                 | mg/l  | TM032W        |
| TOC                                                | <2       | <2       | <2       | <2       | ~        | ~        | ~        | ~        | ~        | ~        | <2                 | mg/l  | TM060W        |
| Total Cyanide**                                    | <40      | <40      | <40      | <40      | <40      | <40      | ~        | <40      | ~        | ~        | <40                | µg/l  | subcontracted |
| Potassium - total                                  | 5.40     | 58.11    | 183.20   | 30.58    | 66.09    | 10.34    | ~        | 4.28     | ~        | ~        | <0.04              | mg/l  | TM 030W       |
| Sodium - total                                     | 31.85    | 477.80   | 756.40   | 108.90   | 113.50   | 19.41    | ~        | 16.40    | ~        | ~        | <0.15              | mg/l  | TM 030W       |
| Calcium - total                                    | 137.80   | 75.36    | 41.78    | 144.70   | 267.50   | 167.40   | ~        | 138.60   | ~        | ~        | <0.03              | mg/l  | TM 030W       |
| Magnesium - total                                  | 10.83    | 60.14    | 136.20   | 43.29    | 71.40    | 9.84     | ~        | 10.47    | ~        | ~        | <0.02              | mg/l  | TM 030W       |
| Mercury - total                                    | <1       | <1       | <1       | <1       | <1       | <1       | ~        | <1       | ~        | ~        | <1                 | µg/l  | TM 030W       |
| Boron - total                                      | 42       | 1223     | 2279     | 473      | 480      | 77       | ~        | 85       | ~        | ~        | <12                | µg/l  | TM 030W       |
| Arsenic - total                                    | <2.5     | 3.5      | 7.7      | 4.0      | 4.9      | <2.5     | ~        | <2.5     | ~        | ~        | <2.5               | µg/l  | TM 030W       |
| Zinc - total                                       | 4        | 5        | 6        | 5        | 6        | 4        | ~        | 17       | ~        | ~        | <3                 | µg/l  | TM 030W       |
| Lead - total                                       | <5       | <5       | <5       | 5        | 6        | 5        | ~        | <5       | ~        | ~        | <5                 | µg/l  | TM 030W       |
| Nickel - total                                     | 3        | 6        | 16       | 5        | 8        | 4        | ~        | 9        | ~        | ~        | <2                 | µg/l  | TM 030W       |
| Copper - total                                     | <7       | <7       | <7       | <7       | <7       | <7       | ~        | 8        | ~        | ~        | <7                 | µg/l  | TM 030W       |
| Chromium - total                                   | 2.0      | 1.8      | 2.7      | 1.8      | 2.7      | 3.0      | ~        | <1.5     | ~        | ~        | <1.5               | µg/l  | TM 030W       |
| Cadmium - total                                    | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | <0.5     | ~        | <0.5     | ~        | ~        | <0.5               | µg/l  | TM 030W       |
| Manganese - total                                  | 17       | 278      | 131      | 504      | 1061     | 1140     | ~        | 1477     | ~        | ~        | <2                 | µg/l  | TM 030W       |
| Iron - total                                       | 31       | 127      | 116      | 152      | 2284     | 433      | ~        | 239      | ~        | ~        | <20                | µg/l  | TM 030W       |
| MRP                                                | 7        | 31       | 84       | 32       | 110      | 29       | ~        | 47       | ~        | ~        | <5                 | µg/l  | TM 030W       |
| Total Dissolved Solids                             | 407      | 1531     | 2871     | 1690     | ~        | ~        | ~        | ~        | ~        | ~        | <35                | mg/l  | TM020W        |
|                                                    |          |          |          |          |          |          |          |          |          |          |                    |       |               |
|                                                    |          |          |          |          |          |          |          |          |          |          |                    |       |               |
|                                                    |          |          |          |          |          |          |          |          |          |          |                    |       |               |

# **Jones Environmental Laboratory**

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** -  
**Contact:** Eleanor Burke  
**JE Job No.:** 09/1801

**VOC Report :** LIQUID

| J E Sample No.              | 1-5      | 6-10     | 11-14    | 15-19    | 20-23    | 24-27    | 32-35    |  |  |  | # UKAS Accredited |       |            |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|--|--|--|-------------------|-------|------------|
| Sample ID                   | BH1      | BH2      | BH3      | BH4      | BH6      | BH14     | BH11     |  |  |  |                   |       |            |
| Depth                       | -        | -        | -        | -        | -        | -        | -        |  |  |  |                   |       |            |
| Containers                  | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G |  |  |  |                   |       |            |
| Sample Date                 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 |  |  |  |                   |       |            |
| Sample Type                 | Water    | Water    | Water    | Water    | Water    | Water    | Water    |  |  |  |                   |       |            |
| Batch Number                | 1        | 1        | 1        | 1        | 1        | 1        | 1        |  |  |  |                   |       |            |
| Date of Receipt             | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 |  |  |  |                   |       |            |
|                             |          |          |          |          |          |          |          |  |  |  | LOD               | Units | Method No. |
| Dichlorodifluoromethane     | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Methyl Tertiary Butyl Ether | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Chloromethane #             | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Vinyl Chloride              | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Bromomethane                | <1       | <1       | <1       | <1       | <1       | <1       | <1       |  |  |  | <1                | µg/l  | TM15/PM10  |
| Chloroethane #              | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Trichlorofluoromethane #    | <3       | <3       | <3       | <3       | <3       | <3       | 10       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,1-Dichloroethene #        | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Carbon Disulphide #         | NA       | NA       | NA       | NA       | NA       | NA       | NA       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Dichloromethane #           | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| trans-1-2-Dichloroethene #  | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,1-Dichloroethane #        | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| cis-1-2-Dichloroethene #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 2,2-Dichloropropane         | <1       | <1       | <1       | <1       | <1       | <1       | <1       |  |  |  | <1                | µg/l  | TM15/PM10  |
| Bromochloromethane #        | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Chloroform #                | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,1,1-Trichloroethane #     | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,1-Dichloropropene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Carbon tetrachloride #      | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,2-Dichloroethane #        | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Benzene #                   | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Trichloroethene             | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,2-Dichloropropane #       | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Dibromomethane #            | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Bromodichloromethane #      | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| cis-1-3-Dichloropropene #   | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Toluene #                   | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| trans-1-3-Dichloropropene # | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,1,2-Trichloroethane #     | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Tetrachloroethene #         | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,3-Dichloropropane #       | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Dibromochloromethane #      | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,2-Dibromoethane #         | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Chlorobenzene #             | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,1,1,2-Tetrachloroethane # | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Ethylbenzene #              | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| p/m-Xylene #                | <5       | <5       | <5       | <5       | <5       | <5       | <5       |  |  |  | <5                | µg/l  | TM15/PM10  |
| o-Xylene #                  | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Styrene #                   | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Bromoform #                 | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| Isopropylbenzene #          | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,1,2,2-Tetrachloroethane   | <4       | <4       | <4       | <4       | <4       | <4       | <4       |  |  |  | <4                | µg/l  | TM15/PM10  |
| Bromobenzene #              | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,2,3-Trichloropropane #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Propylbenzene #             | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 2-Chlorotoluene #           | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,3,5-Trimethylbenzene #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 4-Chlorotoluene #           | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| tert-Butylbenzene #         | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,2,4-Trimethylbenzene #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| sec-Butylbenzene #          | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 4-Isopropyltoluene #        | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,3-Dichlorobenzene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,4-Dichlorobenzene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| n-Butylbenzene #            | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,2-Dichlorobenzene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| 1,2-Dibromo-3-chloropropane | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,2,4-Trichlorobenzene      | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Hexachlorobutadiene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |
| Naphthalene                 | <2       | <2       | <2       | <2       | <2       | <2       | <2       |  |  |  | <2                | µg/l  | TM15/PM10  |
| 1,2,3-Trichlorobenzene      | <3       | <3       | <3       | <3       | <3       | <3       | <3       |  |  |  | <3                | µg/l  | TM15/PM10  |

# **Jones Environmental Laboratory**

**Client Name:** Malone O'Regan

**SVOC Report :** LIQUID

**Reference:** E0715

**Location:** -

**Contact:** Eleanor Burke

**JE Job No.:** 09/1801

| J E Sample No.              | 1-5      | 6-10     | 11-14    | 15-19    | 20-23    | 24-27    | 32-35    |  |  |  | # UKAS Accredited |       |            |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|--|--|--|-------------------|-------|------------|
| Sample ID                   | BH1      | BH2      | BH3      | BH4      | BH6      | BH14     | BH11     |  |  |  |                   |       |            |
| Depth                       | -        | -        | -        | -        | -        | -        | -        |  |  |  |                   |       |            |
| Containers                  | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G |  |  |  |                   |       |            |
| Sample Date                 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 | 25/06/09 |  |  |  |                   |       |            |
| Sample Type                 | Water    | Water    | Water    | Water    | Water    | Water    | Water    |  |  |  |                   |       |            |
| Batch Number                | 1        | 1        | 1        | 1        | 1        | 1        | 1        |  |  |  |                   |       |            |
| Date of Receipt             | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 | 26/06/09 |  |  |  | LOD               | Units | Method No. |
| <b>Phenols</b>              |          |          |          |          |          |          |          |  |  |  |                   |       |            |
| 2-Chlorophenol              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2-Methylphenol              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2-Nitrophenol               | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2,4-Dichlorophenol          | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2,4-Dimethylphenol          | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2,4,5-Trichlorophenol       | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2,4,6-Trichlorophenol       | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Chloro-3-methylphenol     | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Methylphenol              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Nitrophenol               | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Pentachlorophenol           | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Phenol                      | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| <b>PAHs</b>                 |          |          |          |          |          |          |          |  |  |  |                   |       |            |
| 2-Chloronaphthalene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2-Methylnaphthalene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Naphthalene                 | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Acenaphthylene              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Acenaphthene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Fluorene                    | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Phenanthrene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Anthracene                  | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Fluoranthene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Pyrene                      | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Benz(a)anthracene           | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Chrysene                    | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Benzo(b)kfluoranthene       | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Benzo(a)pyrene              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Indeno(123cd)pyrene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Dibenzo(ah)anthracene       | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Benzo(ghi)perylene          | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| <b>Phthalates</b>           |          |          |          |          |          |          |          |  |  |  |                   |       |            |
| Bis(2-ethylhexyl) phthalate | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Butylbenzyl phthalate       | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Di-n-butyl phthalate        | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Di-n-Octyl phthalate        | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Diethyl phthalate           | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Dimethyl phthalate          | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| <b>Other SVOCs</b>          |          |          |          |          |          |          |          |  |  |  |                   |       |            |
| 1,2-Dichlorobenzene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 1,2,4-Trichlorobenzene      | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 1,3-Dichlorobenzene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 1,4-Dichlorobenzene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2-Nitroaniline              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2,4-Dinitrotoluene          | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 2,6-Dinitrotoluene          | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 3-Nitroaniline              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Bromophenylphenylether    | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Chloroaniline             | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Chlorophenylphenylether   | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| 4-Nitroaniline              | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Azobenzene                  | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Bis(2-chloroethoxy)methane  | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Bis(2-chloroethyl)ether     | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Carbazole                   | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Dibenzofuran                | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Hexachlorobenzene           | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Hexachlorobutadiene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Hexachlorocyclopentadiene   | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Hexachloroethane            | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Isophorone                  | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| N-nitrosodi-n-propylamine   | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |
| Nitrobenzene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      |  |  |  | <10               | µg/ l | TM16/PM9   |



## *Jones Environmental Forensics Ltd*

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Malone O'Regan  
2b Richview Office Park  
Clonskeagh  
Dublin 14



Attention: Donal O'Keeffe

|                               |                     |
|-------------------------------|---------------------|
| <b>Date:</b>                  | 3rd August 2009     |
| <b>Your reference:</b>        | E0715               |
| <b>Our reference :</b>        | Test Report 09/2082 |
| <b>Location :</b>             | Finisklin Landfill  |
| <b>Date samples received:</b> | 17th July 2009      |
| <b>Status:</b>                | Final Report        |
| <b>Issue:</b>                 | 2                   |

Fourteen water samples were received for analysis on 17th July 2009 which was completed on 31st July 2009. Please find attached our Test Report which should include all sections if reproduced. All interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Signed**

**J W Farrell- Jones CChem FRSC**  
**Chartered Chemist**

# Jones Environmental Laboratory

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Finisklin Landfill  
**Contact:** Donal O'Keeffe  
**JE Job No.:** 09/2082

## Report - liquids

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HNO<sub>3</sub>

| J E Sample No.                          | 1-4      | 5-8      | 9-13     | 14-17    | 18-21    | 22-25    | 26-29    | 30-32    | 33-36    | 37-40    |                   |       |               |
|-----------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------------|-------|---------------|
| Sample ID                               | BH-1     | BH-3     | BH-4     | BH-6     | BH-10    | BH-13    | BH2      | BH5      | BH11     | BH14     |                   |       |               |
| Depth                                   | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |                   |       |               |
| Containers                              | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V & G    | V, P & G | V, P & G | ND - Not Detected |       |               |
| Sample Date                             | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | ** Subcontracted  |       |               |
| Sample Type                             | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    |                   |       |               |
| Batch Number                            | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | # UKAS Accredited |       |               |
| Date of Receipt                         | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | LOD               | Units | Method No.    |
| VOCs #                                  | See Tab  | See Tab  | See Tab  | See Tab  | ~        | ~        | See Tab  | ~        | See Tab  | See Tab  | <1.5              | µg/l  | TM15/PM10     |
| VOCs TICs                               | ND       | ND       | ND       | ND       | ~        | ~        | ND       | ~        | ND       | ND       | <100              | µg/l  | TM15/PM10     |
| SVOCs (dissolved)                       | See Tab  | See Tab  | See Tab  | See Tab  | ~        | ~        | See Tab  | ~        | See Tab  | See Tab  | <10               | µg/l  | TM16/PM9      |
| SVOC TICs                               | ND       | ND       | ND       | ND       | ~        | ~        | ND       | ~        | ND       | ND       | <100              | µg/l  | TM16/PM9      |
| Dibutyltin                              | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | <0.1              | µg/l  | TM046/PM9     |
| Tributyltin                             | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | <0.1              | µg/l  | TM046/PM9     |
| Triphenyltin                            | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | ~        | <0.1              | µg/l  | TM046/PM9     |
| Atrazine                                | <1       | <1       | <1       | <1       | ~        | ~        | <1       | ~        | <1       | <1       | <1                | µg/l  | TM39/PM9      |
| Simazine                                | <1       | <1       | <1       | <1       | ~        | ~        | <1       | ~        | <1       | <1       | <1                | µg/l  | TM39/PM9      |
| Sulphate#                               | 40.39    | 57.26    | 1.16     | 82.70    | ~        | ~        | 94.71    | ~        | 62.57    | 1.05     | <0.05             | mg/l  | TM038W        |
| Chloride#                               | 42.8     | 788.8    | 122.2    | 82.3     | ~        | ~        | 457.1    | ~        | 14.4     | 21.4     | <0.3              | mg/l  | TM038W        |
| Fluoride                                | <0.3     | 0.5      | <0.3     | <0.3     | ~        | ~        | 0.4      | ~        | <0.3     | <0.3     | <0.3              | mg/l  | TM038W        |
| Total Oxidised Nitrogen as N#           | 0.43     | <0.05    | <0.05    | <0.05    | ~        | ~        | <0.05    | ~        | 0.31     | <0.05    | <0.05             | mg/l  | TM038W        |
| Ammonia as N                            | 0.4      | 75.9     | 31.1     | 62.4     | ~        | ~        | 22.1     | ~        | 0.5      | 8.7      | <0.1              | mg/l  | TM053W        |
| Total Dissolved Solids                  | 408      | 2745     | 742      | ~        | ~        | ~        | 1571     | ~        | ~        | ~        | <35               | mg/l  | TM020W        |
| TOC                                     | <2       | 12       | <2       | ~        | ~        | ~        | <2       | ~        | ~        | ~        | <2                | mg/l  | TM060W        |
| COD                                     | ~        | ~        | ~        | 73       | ~        | ~        | ~        | ~        | 14       | 25       | <7                | mg/l  | TM057W        |
| Total Alkalinity as CaCO <sub>3</sub> # | 268      | 1685     | 608      | ~        | ~        | ~        | 800      | ~        | ~        | ~        | <1                | mg/l  | TM032W        |
| Calcium - total                         | 127.70   | 58.60    | 125.40   | 251.00   | ~        | ~        | 83.26    | ~        | 108      | 178.1    | <0.03             | mg/l  | TM 030W       |
| Potassium - total                       | 4.66     | 119.10   | 23.55    | 47.76    | ~        | ~        | 44.53    | ~        | 2.33     | 8.92     | <0.04             | mg/l  | TM 030W       |
| Magnesium - total                       | 11.64    | 101.60   | 37.03    | 61.62    | ~        | ~        | 49.59    | ~        | 7.28     | 10.32    | <0.02             | mg/l  | TM 030W       |
| Sodium - total                          | 31.66    | 633.40   | 85.17    | 74.11    | ~        | ~        | 388      | ~        | 10.24    | 14.41    | <0.15             | mg/l  | TM 030W       |
| Iron - total                            | 273      | 11630    | 21240    | 19920    | ~        | ~        | 9278     | ~        | 5539     | 129500   | <20               | µg/l  | TM 030W       |
| Manganese - total                       | 100      | 533      | 617      | 1754     | ~        | ~        | 462      | ~        | 344      | 1693     | <2                | µg/l  | TM 030W       |
| Cadmium - total                         | <0.5     | <0.5     | 0.7      | 1.6      | ~        | ~        | <0.5     | ~        | <0.5     | 6.3      | <0.5              | µg/l  | TM 030W       |
| Chromium - total                        | <1.5     | 4.5      | 5.7      | 18.9     | ~        | ~        | 4        | ~        | 2.8      | 36.3     | <1.5              | µg/l  | TM 030W       |
| Copper - total                          | 9        | 33       | <7       | 43       | ~        | ~        | 8        | ~        | 26       | 35       | <7                | µg/l  | TM 030W       |
| Nickel - total                          | 6        | 9        | <2       | 26       | ~        | ~        | 10       | ~        | 4        | 8        | <2                | µg/l  | TM 030W       |
| Lead - total                            | <5       | <5       | <5       | 84       | ~        | ~        | 5        | ~        | 9        | 60       | <5                | µg/l  | TM 030W       |
| Zinc - total                            | 12       | 18       | 9        | 362      | ~        | ~        | 28       | ~        | 54       | 101      | <3                | µg/l  | TM 030W       |
| Boron - total                           | 70       | 2471     | 535      | 461      | ~        | ~        | 1353     | ~        | 98       | <12      | <12               | µg/l  | TM 030W       |
| Mercury - total                         | <1       | <1       | <1       | <1       | ~        | ~        | <1       | ~        | <1       | <1       | <1                | µg/l  | TM 030W       |
| Arsenic - total                         | <2.5     | 8        | 9.3      | 8.5      | ~        | ~        | 13.5     | ~        | 2.9      | 30       | <2.5              | µg/l  | TM 030W       |
| Molybdenum Reactive Phosphorus          | 57       | 405      | 330      | 672      | ~        | ~        | 290      | ~        | 416      | 1032     | <5                | µg/l  | TM 030W       |
| Total Cyanide**                         | <40      | <40      | <40      | <40      | ~        | ~        | <40      | ~        | <40      | <40      | <40               | µg/l  | subcontracted |



**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Finisklin Landfill  
**Contact:** Donal O'Keeffe  
**JE Job No.:** 09/2082

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HN0<sub>3</sub>

ND - Not Detected

\*\* Subcontracted

# UKAS Accredited

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Finisklin Landfill  
**Contact:** Donal O'Keefe  
**JE Job No.:** 09/082

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HN0<sub>3</sub>

[illegible]

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Finisklin Landfill  
**Contact:** Donal O'Keeffe  
**JE Job No.:** 09/2082

**Liquids/products:** V=40ml vial, G=glass bottle, P=plastic bottle  
H=H<sub>2</sub>SO<sub>4</sub>, Z=ZnAc, N=NaOH, HN=HN0<sub>3</sub>

OF-PM 3.1 v3

# **Jones Environmental Laboratory**

**Client Name:** Malone O'Regan

**VOC Report :** LIQUID

**Reference:** E0715

**Location:** Finisklin Landfill

**Contact:** Donal O'Keefe

**JE Job No.:** 09/2082

| J E Sample No.              | 1-4      | 5-8      | 9-13     | 14-17    | 26-29    | 33-36    | 37-40    | 41-43    | 44-46    | 47-49    | # UKAS Accredited |       |            |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------------|-------|------------|
| Sample ID                   | BH-1     | BH-3     | BH-4     | BH-6     | BH2      | BH11     | BH14     | SW-1     | SW-2     | SW-3     |                   |       |            |
| Depth                       | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |                   |       |            |
| Containers                  | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G |                   |       |            |
| Sample Date                 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 |                   |       |            |
| Sample Type                 | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    |                   |       |            |
| Batch Number                | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | LOD               | Units | Method No. |
| Date of Receipt             | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 |                   |       |            |
| Dichlorodifluoromethane     | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Methyl Tertiary Butyl Ether | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Chloromethane #             | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Vinyl Chloride              | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Bromomethane                | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1                | µg/l  | TM15/PM10  |
| Chloroethane #              | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Trichlorofluoromethane #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,1-Dichloroethene #        | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Carbon Disulphide #         | NA       | NA       | NA       | NA       | NA       | NA       | NA       | NA       | NA       | NA       | <3                | µg/l  | TM15/PM10  |
| Dichloromethane             | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| trans-1-2-Dichloroethene #  | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,1-Dichloroethane #        | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| cis-1-2-Dichloroethene #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 2,2-Dichloropropane         | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1       | <1                | µg/l  | TM15/PM10  |
| Bromochloromethane #        | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Chloroform #                | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,1,1-Trichloroethane #     | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,1-Dichloropropene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Carbon tetrachloride #      | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,2-Dichloroethane #        | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Benzene #                   | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Trichloroethene             | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,2-Dichloropropane #       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Dibromomethane #            | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Bromodichloromethane #      | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| cis-1-3-Dichloropropene #   | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Toluene #                   | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| trans-1-3-Dichloropropene # | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,1,2-Trichloroethane #     | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Tetrachloroethene #         | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,3-Dichloropropane #       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Dibromochloromethane #      | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,2-Dibromoethane #         | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Chlorobenzene #             | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,1,1,2-Tetrachloroethane # | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Ethylbenzene #              | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| p/m-Xylene #                | <5       | <5       | <5       | <5       | <5       | <5       | <5       | <5       | <5       | <5       | <5                | µg/l  | TM15/PM10  |
| o-Xylene #                  | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Styrene #                   | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Bromoform #                 | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| Isopropylbenzene #          | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,1,2,2-Tetrachloroethane   | <4       | <4       | <4       | <4       | <4       | <4       | <4       | <4       | <4       | <4       | <4                | µg/l  | TM15/PM10  |
| Bromobenzene #              | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,2,3-Trichloropropane #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Propylbenzene #             | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 2-Chlorotoluene #           | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,3,5-Trimethylbenzene #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 4-Chlorotoluene #           | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| tert-Butylbenzene #         | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,2,4-Trimethylbenzene #    | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| sec-Butylbenzene #          | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 4-Isopropyltoluene #        | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,3-Dichlorobenzene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,4-Dichlorobenzene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| n-Butylbenzene #            | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,2-Dichlorobenzene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| 1,2-Dibromo-3-chloropropane | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,2,4-Trichlorobenzene      | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Hexachlorobutadiene #       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |
| Naphthalene                 | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2       | <2                | µg/l  | TM15/PM10  |
| 1,2,3-Trichlorobenzene      | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3       | <3                | µg/l  | TM15/PM10  |

***Client Name:*** Malone O'Regan  
***Reference:*** E0715  
***Location:*** Finisklin Landfill  
***Contact:*** Donal O'Keeffe  
***JE Job No.:*** 09/2082

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All solid results are expressed on a dry weight basis unless stated otherwise.



# Jones Environmental Laboratory

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Finisklin Landfill  
**Contact:** Donal O'Keeffe  
**JE Job No.:** 09/2082

**SVOC Report :** LIQUID

| J E Sample No.              | 1-4      | 5-8      | 9-13     | 14-17    | 26-29    | 33-36    | 37-40    | 41-43    | 44-46    | 47-49    |                     |       |            |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------------|-------|------------|
| Sample ID                   | BH-1     | BH-3     | BH-4     | BH-6     | BH2      | BH11     | BH14     | SW-1     | SW-2     | SW-3     |                     |       |            |
| Depth                       | -        | -        | -        | -        | -        | -        | -        | -        | -        | -        |                     |       |            |
| Containers                  | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G | V, P & G |                     |       |            |
| Sample Date                 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | 16/07/09 | M MCERTS Accredited |       |            |
| Sample Type                 | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | Water    | # UKAS Accredited   |       |            |
| Batch Number                | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        | 1        |                     |       |            |
| Date of Receipt             | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | 17/07/09 | LOD                 | Units | Method No. |
|                             |          |          |          |          |          |          |          |          |          |          |                     |       |            |
| <b>Phenols</b>              |          |          |          |          |          |          |          |          |          |          |                     |       |            |
| 2-Chlorophenol              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2-Methylphenol              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2-Nitrophenol               | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2,4-Dichlorophenol          | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2,4-Dimethylphenol          | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2,4,5-Trichlorophenol       | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2,4,6-Trichlorophenol       | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Chloro-3-methylphenol     | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Methylphenol              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Nitrophenol               | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Pentachlorophenol           | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Phenol                      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| <b>PAHs</b>                 |          |          |          |          |          |          |          |          |          |          |                     |       |            |
| 2-Chloronaphthalene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2-Methylnaphthalene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Naphthalene                 | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Acenaphthylene              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Acenaphthene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Fluorene                    | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Phenanthrene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Anthracene                  | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Fluoranthene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Pyrene                      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Benz(a)anthracene           | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Chrysene                    | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Benzo(b)kfluoranthene       | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Benzo(a)pyrene              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Indeno(123cd)pyrene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Dibenzo(ah)anthracene       | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Benzo(ghi)perylene          | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| <b>Phthalates</b>           |          |          |          |          |          |          |          |          |          |          |                     |       |            |
| Bis(2-ethylhexyl) phthalate | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Butylbenzyl phthalate       | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Di-n-butyl phthalate        | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Di-n-Octyl phthalate        | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Diethyl phthalate           | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Dimethyl phthalate          | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| <b>Other SVOCs</b>          |          |          |          |          |          |          |          |          |          |          |                     |       |            |
| 1,2-Dichlorobenzene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 1,2,4-Trichlorobenzene      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 1,3-Dichlorobenzene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 1,4-Dichlorobenzene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2-Nitroaniline              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2,4-Dinitrotoluene          | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 2,6-Dinitrotoluene          | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 3-Nitroaniline              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Bromophenylphenylether    | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Chloroaniline             | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Chlorophenylphenylether   | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| 4-Nitroaniline              | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Azobenzene                  | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Bis(2-chloroethoxy)methane  | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Bis(2-chloroethyl)ether     | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Carbazole                   | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Dibenzofuran                | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Hexachlorobenzene           | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Hexachlorobutadiene         | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Hexachlorocyclopentadiene   | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Hexachloroethane            | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Isophorone                  | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| N-nitrosodi-n-propylamine   | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |
| Nitrobenzene                | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10      | <10                 | µg/ l | TM16/PM9   |

**Client Name:** Malone O'Regan  
**Reference:** E0715  
**Location:** Finisklin Landfill  
**Contact:** Donal O'Keeffe  
**JE Job No.:** 09/2082

SVOC Report : LIQUID

<sup>M</sup> MCERTS Accredited  
<sup>#</sup> UKAS Accredited

**Jones Environmental Laboratory**

**Job number:** 09/2082

**Sample number:** 6

**Sample identity:** BH-3

**Sample depth:**

**Sample Type:**

Units: ug/l

**note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported**

### VOCs - Tentatively Identified Compounds (TICs)

| Method | TM15/PM10 |
|--------|-----------|
|--------|-----------|

| Tentative Compound Identification | Retention Time (minutes) | Concentration |
|-----------------------------------|--------------------------|---------------|
| Benzene, hexafluoro-              | 3.08                     | <100          |

# APPENDIX I

Appendix I: Continuous Gas Monitoring Data from BH8

| Date/Time        | CH4  | CO2  | O2  | BALANCE | CH4 %LEL | PEAKCH4 | BARO.<br>PRESSURE | REL.PRESSURE | INTERNAL<br>FLOW | CO  | H2S | CH4/CO2 | Res Nitrogen |
|------------------|------|------|-----|---------|----------|---------|-------------------|--------------|------------------|-----|-----|---------|--------------|
|                  | %    | %    | %   | %       | %        | %       | mb                | mb           | l/h              | ppm | ppm | %       | %            |
| 16/04/2010 06:33 | 43.0 | 15.3 | 4.4 | 37.3    | 200.0    | 43.0    | 1025.0            | 0.4          | 0.0              | 0.0 | 3.0 | 2.8     | 20.7         |
| 16/04/2010 06:34 | 43.6 | 15.6 | 3.5 | 37.3    | 200.0    | 43.6    | 1025.0            | 0.4          | 0.0              | 0.0 | 2.0 | 2.8     | 24.1         |
| 16/04/2010 06:35 | 44.5 | 15.8 | 3.2 | 36.5    | 200.0    | 44.5    | 1025.0            | 0.4          | 0.0              | 0.0 | 2.0 | 2.8     | 24.4         |
| 16/04/2010 06:36 | 45.3 | 16.1 | 2.9 | 35.7    | 200.0    | 45.3    | 1025.0            | 0.4          | 0.0              | 1.0 | 2.0 | 2.8     | 24.7         |
| 16/04/2010 06:37 | 46.1 | 16.3 | 2.6 | 35.0    | 200.0    | 46.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 1.0 | 2.8     | 25.2         |
| 16/04/2010 06:38 | 46.8 | 16.5 | 2.4 | 34.3    | 200.0    | 46.8    | 1025.0            | 0.5          | 0.0              | 1.0 | 1.0 | 2.8     | 25.2         |
| 16/04/2010 06:39 | 47.6 | 16.6 | 2.1 | 33.7    | 200.0    | 47.6    | 1025.0            | 0.5          | 0.0              | 2.0 | 1.0 | 2.9     | 25.8         |
| 16/04/2010 06:40 | 48.1 | 16.9 | 1.9 | 33.1    | 200.0    | 48.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 0.0 | 2.9     | 25.9         |
| 16/04/2010 06:41 | 48.6 | 17.0 | 1.7 | 32.7    | 200.0    | 48.6    | 1025.0            | 0.5          | 0.0              | 0.0 | 0.0 | 2.9     | 26.3         |
| 16/04/2010 06:42 | 49.4 | 17.3 | 1.5 | 31.8    | 200.0    | 49.4    | 1025.0            | 0.5          | 0.0              | 0.0 | 0.0 | 2.9     | 26.1         |
| 16/04/2010 06:43 | 50.0 | 17.4 | 1.3 | 31.3    | 200.0    | 50.0    | 1025.0            | 0.5          | 0.0              | 1.0 | 0.0 | 2.9     | 26.4         |
| 16/04/2010 06:44 | 50.7 | 17.6 | 1.1 | 30.6    | 200.0    | 50.7    | 1025.0            | 0.5          | 0.0              | 1.0 | 0.0 | 2.9     | 26.4         |
| 16/04/2010 06:45 | 51.3 | 17.8 | 0.8 | 30.1    | 200.0    | 51.3    | 1025.0            | 0.5          | 0.0              | 0.0 | 1.0 | 2.9     | 27.1         |
| 16/04/2010 06:46 | 51.7 | 17.9 | 0.7 | 29.7    | 200.0    | 51.7    | 1025.0            | 0.5          | 0.0              | 1.0 | 1.0 | 2.9     | 27.1         |
| 16/04/2010 06:47 | 52.1 | 18.0 | 0.6 | 29.3    | 200.0    | 52.1    | 1025.0            | 0.5          | 0.0              | 1.0 | 1.0 | 2.9     | 27.0         |
| 16/04/2010 06:48 | 52.4 | 18.1 | 0.4 | 29.1    | 200.0    | 52.4    | 1025.0            | 0.5          | 0.0              | 1.0 | 1.0 | 2.9     | 27.6         |
| 16/04/2010 06:49 | 52.7 | 18.2 | 0.3 | 28.8    | 200.0    | 52.7    | 1025.0            | 0.5          | 0.0              | 1.0 | 2.0 | 2.9     | 27.7         |
| 16/04/2010 06:50 | 52.9 | 18.2 | 0.3 | 28.6    | 200.0    | 52.9    | 1025.0            | 0.5          | 0.0              | 1.0 | 2.0 | 2.9     | 27.5         |
| 16/04/2010 06:51 | 53.2 | 18.3 | 0.2 | 28.3    | 200.0    | 53.3    | 1025.0            | 0.5          | 0.0              | 1.0 | 2.0 | 2.9     | 27.5         |
| 16/04/2010 06:52 | 53.3 | 18.4 | 0.1 | 28.2    | 200.0    | 53.3    | 1025.0            | 0.5          | 0.0              | 0.0 | 2.0 | 2.9     | 27.8         |
| 16/04/2010 06:53 | 53.4 | 18.4 | 0.1 | 28.1    | 200.0    | 53.4    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 27.7         |
| 16/04/2010 06:54 | 53.5 | 18.4 | 0.0 | 28.1    | 200.0    | 53.5    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 28.1         |
| 16/04/2010 06:55 | 53.7 | 18.5 | 0.0 | 27.8    | 200.0    | 53.7    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 27.8         |
| 16/04/2010 06:56 | 53.9 | 18.5 | 0.0 | 27.6    | 200.0    | 53.9    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 27.6         |
| 16/04/2010 06:57 | 53.9 | 18.5 | 0.0 | 27.6    | 200.0    | 53.9    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 27.6         |
| 16/04/2010 06:58 | 53.3 | 18.4 | 0.2 | 28.1    | 200.0    | 54.0    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 27.3         |
| 16/04/2010 06:59 | 53.6 | 18.4 | 0.0 | 28.0    | 200.0    | 53.6    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 28.0         |
| 16/04/2010 07:00 | 54.0 | 18.5 | 0.0 | 27.5    | 200.0    | 54.0    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 27.5         |
| 16/04/2010 07:01 | 54.1 | 18.5 | 0.0 | 27.4    | 200.0    | 54.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 27.4         |
| 16/04/2010 07:02 | 54.1 | 18.6 | 0.0 | 27.3    | 200.0    | 54.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 27.3         |
| 16/04/2010 07:03 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.3    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 27.1         |
| 16/04/2010 07:04 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 27.0         |
| 16/04/2010 07:05 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 26.9         |
| 16/04/2010 07:06 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.8         |
| 16/04/2010 07:07 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.8         |
| 16/04/2010 07:08 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.7    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.8         |
| 16/04/2010 07:09 | 54.8 | 18.7 | 0.0 | 26.5    | 200.0    | 54.8    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.5         |
| 16/04/2010 07:10 | 54.8 | 18.7 | 0.0 | 26.5    | 200.0    | 54.9    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.5         |
| 16/04/2010 07:11 | 54.8 | 18.7 | 0.0 | 26.5    | 200.0    | 54.9    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.5         |
| 16/04/2010 07:12 | 54.8 | 18.7 | 0.0 | 26.5    | 200.0    | 54.9    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.5         |
| 16/04/2010 07:13 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.3         |
| 16/04/2010 07:14 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.3         |
| 16/04/2010 07:15 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.3         |
| 16/04/2010 07:16 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.3         |
| 16/04/2010 07:17 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 26.3         |
| 16/04/2010 07:18 | 55.1 | 18.7 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 3.0     | 26.2         |
| 16/04/2010 07:19 | 55.1 | 18.7 | 0.0 | 26.2    | 200.0    | 55.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 3.0     | 26.2         |
| 16/04/2010 07:20 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 26.1         |
| 16/04/2010 07:21 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 26.1         |
| 16/04/2010 07:22 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 4.0 | 2.9     | 26.1         |
| 16/04/2010 07:23 | 55.1 | 18.7 | 0.0 | 26.2    | 200.0    | 55.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 3.0     | 26.2         |
| 16/04/2010 07:24 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.2    | 1025.0            | 0.5          | 0.0              | 0.0 | 3.0 | 2.9     | 26.0         |
| 16/04/2010 07:25 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:26 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:27 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:28 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:29 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:30 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:31 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:32 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:33 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:34 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:35 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:36 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:37 | 55.3 | 18.8 | 0.0 | 25.9    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 25.9         |
| 16/04/2010 07:38 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.4    | 1025.0            | 0.4          | 0.0              | 0.0 | 4.0 | 2.9     | 26.0         |
| 16/04/2010 07:39 | 55.3 | 18.8 | 0.0 | 25.9    | 200.0    | 55.4    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 25.9         |
| 16/04/2010 07:40 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:41 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:42 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:43 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:44 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 1.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:45 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:46 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:47 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.1         |
| 16/04/2010 07:48 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.3    | 1025.0            | 0.4          | 0.0              | 0.0 | 5.0 | 2.9     | 26.0         |
| 16/04/2010 07:49 | 55.2 | 18.8 | 0.0 | 26.0    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 0.0 | 6.0 | 2.9     | 26.0         |
| 16/04/2010 07:50 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 0.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:51 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 1.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:52 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 1.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:53 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.1    | 1025.0            | 0.4          | 0.0              | 1.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:54 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 0.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:55 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.1    | 1025.0            | 0.4          | 0.0              | 0.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:56 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 0.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:57 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 1.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:58 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.1    | 1025.0            | 0.4          | 0.0              | 1.0 | 6.0 | 2.9     | 26.1         |
| 16/04/2010 07:59 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0            | 0.4          | 0.0              | 1.0 |     |         |              |

## Appendix I: Continuous Gas Monitoring Data from BH8

| Date/Time        | CH4  | CO2  | O2  | BALANCE | CH4 %LEL | PEAKCH4 | BARO. PRESSURE | REL.PRESSURE | INTERNAL FLOW | CO  | H2S | CH4/CO2 | Res Nitrogen |
|------------------|------|------|-----|---------|----------|---------|----------------|--------------|---------------|-----|-----|---------|--------------|
|                  | %    | %    | %   | %       | %        | %       | mb             | mb           | l/h           | ppm | ppm | %       | %            |
| 16/04/2010 08:12 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.1         |
| 16/04/2010 08:13 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.1         |
| 16/04/2010 08:14 | 55.1 | 18.8 | 0.0 | 26.1    | 200.0    | 55.2    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.1         |
| 16/04/2010 08:15 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:16 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 0.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:17 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:18 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:19 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.3         |
| 16/04/2010 08:20 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:21 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 6.0 | 2.9     | 26.2         |
| 16/04/2010 08:22 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:23 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:24 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:25 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:26 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:27 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:28 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:29 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:30 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:31 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.2         |
| 16/04/2010 08:33 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:34 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.2         |
| 16/04/2010 08:35 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:36 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:37 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:38 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:39 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:40 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:41 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:42 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:43 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.2         |
| 16/04/2010 08:44 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:45 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:46 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:47 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:48 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:49 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:50 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.4         |
| 16/04/2010 08:51 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 08:52 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.3         |
| 16/04/2010 08:53 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.4         |
| 16/04/2010 08:54 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.4         |
| 16/04/2010 08:55 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.3         |
| 16/04/2010 08:56 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.5          | 0.0           | 1.0 | 7.0 | 2.9     | 26.3         |
| 16/04/2010 08:57 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 08:58 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 6.0 | 2.9     | 26.3         |
| 16/04/2010 08:59 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.4          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 09:00 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.5          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 09:01 | 55.0 | 18.8 | 0.0 | 26.2    | 200.0    | 55.0    | 1025.0         | 0.5          | 0.0           | 1.0 | 7.0 | 2.9     | 26.2         |
| 16/04/2010 09:02 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.5          | 0.0           | 1.0 | 7.0 | 2.9     | 26.3         |
| 16/04/2010 09:03 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 0.5          | 0.0           | 1.0 | 7.0 | 2.9     | 26.3         |
| 16/04/2010 09:04 | 54.8 | 18.7 | 0.0 | 26.5    | 200.0    | 55.0    | 1025.0         | 0.5          | 0.0           | 1.0 | 7.0 | 2.9     | 26.5         |
| 16/04/2010 09:05 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.5          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 09:06 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.5          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 09:07 | 54.9 | 18.8 | 0.0 | 26.3    | 200.0    | 54.9    | 1025.0         | 0.5          | 0.0           | 1.0 | 8.0 | 2.9     | 26.3         |
| 16/04/2010 09:08 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 0.5          | 0.0           | 1.0 | 8.0 | 2.9     | 26.4         |
| 16/04/2010 09:09 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.8    | 1025.0         | 0.5          | 0.0           | 1.0 | 8.0 | 2.9     | 26.4         |
| 16/04/2010 09:10 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.8    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.4         |
| 16/04/2010 09:11 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.8    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.4         |
| 16/04/2010 09:12 | 54.7 | 18.8 | 0.0 | 26.5    | 200.0    | 54.8    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.5         |
| 16/04/2010 09:13 | 54.7 | 18.8 | 0.0 | 26.5    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.5         |
| 16/04/2010 09:14 | 54.7 | 18.8 | 0.0 | 26.5    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.5         |
| 16/04/2010 09:15 | 54.7 | 18.8 | 0.0 | 26.5    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.5         |
| 16/04/2010 09:16 | 54.8 | 18.8 | 0.0 | 26.4    | 200.0    | 54.8    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.4         |
| 16/04/2010 09:17 | 54.7 | 18.8 | 0.0 | 26.5    | 200.0    | 54.8    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.5         |
| 16/04/2010 09:18 | 54.7 | 18.8 | 0.0 | 26.5    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.5         |
| 16/04/2010 09:19 | 54.7 | 18.7 | 0.0 | 26.6    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.6         |
| 16/04/2010 09:20 | 54.7 | 18.7 | 0.0 | 26.6    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.6         |
| 16/04/2010 09:21 | 54.7 | 18.7 | 0.0 | 26.6    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 8.0 | 2.9     | 26.6         |
| 16/04/2010 09:22 | 54.7 | 18.7 | 0.0 | 26.6    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.6         |
| 16/04/2010 09:23 | 54.7 | 18.7 | 0.0 | 26.6    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.6         |
| 16/04/2010 09:24 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.7    | 1025.0         | 0.5          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:25 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.7    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:26 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:27 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:28 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:29 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:30 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:31 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:32 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:33 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.7    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:34 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:35 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 2.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:36 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 2.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:37 | 54.6 | 18.7 | 0.0 | 26.7    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.7         |
| 16/04/2010 09:38 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 1.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:39 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          | 0.0           | 2.0 | 9.0 | 2.9     | 26.8         |
| 16/04/2010 09:40 | 54.5 | 18.7 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 0.6          |               |     |     |         |              |

**Note:**  
Internal flow reading was from the start of day.



**Note:**  
Internal flow reading was from the start of day.

**Note:**  
Internal flow reading was from the start of day.

## Appendix I: Continuous Gas Monitoring Data from BH8

| Date/Time        | CH4  | CO2  | O2  | BALANCE | CH4 %LEL | PEAKCH4 | BARO. PRESSURE | REL.PRESSURE | INTERNAL FLOW | CO  | H2S  | CH4/CO2 | Res Nitrogen |
|------------------|------|------|-----|---------|----------|---------|----------------|--------------|---------------|-----|------|---------|--------------|
|                  | %    | %    | %   | %       | %        | %       | mb             | mb           | l/h           | ppm | ppm  | %       | %            |
| 16/04/2010 11:30 | 54.3 | 18.5 | 0.0 | 27.2    | 200.0    | 54.4    | 1025.0         | 1.2          | 0.0           | 4.0 | 10.0 | 2.9     | 27.2         |
| 16/04/2010 11:31 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 11.0 | 3.0     | 27.2         |
| 16/04/2010 11:32 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:33 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:34 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:35 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:36 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:37 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 11:38 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 11:39 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:40 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 11:41 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 11.0 | 2.9     | 27.1         |
| 16/04/2010 11:42 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:43 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:44 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 11:45 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.8    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:46 | 54.3 | 18.4 | 0.0 | 27.3    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.3         |
| 16/04/2010 11:47 | 54.3 | 18.4 | 0.0 | 27.3    | 200.0    | 54.4    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.3         |
| 16/04/2010 11:48 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.4    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:49 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:50 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:51 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 11.0 | 3.0     | 27.2         |
| 16/04/2010 11:52 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:53 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:54 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:55 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 11:56 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:57 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:58 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 11:59 | 54.4 | 18.4 | 0.0 | 27.2    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.2         |
| 16/04/2010 12:00 | 54.6 | 18.4 | 0.0 | 27.0    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 11.0 | 3.0     | 27.0         |
| 16/04/2010 12:01 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 11.0 | 3.0     | 27.1         |
| 16/04/2010 12:02 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 12:03 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 11.0 | 3.0     | 27.1         |
| 16/04/2010 12:04 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 12:05 | 54.5 | 18.4 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.1         |
| 16/04/2010 12:06 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:07 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:08 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:09 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 3.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 12:10 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 12:11 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 12:12 | 54.5 | 18.5 | 0.0 | 27.0    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 3.0     | 27.0         |
| 16/04/2010 12:13 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.6    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:14 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.3          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:15 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.2          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:16 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 4.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:17 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:18 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:19 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:20 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:21 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:22 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:23 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:24 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:25 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:26 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:27 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:28 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:29 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.2          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:30 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:31 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:32 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 12:33 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:34 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:35 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:36 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:37 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:38 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:39 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:40 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:41 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:42 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:43 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.7    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:44 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.8         |
| 16/04/2010 12:45 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:46 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:47 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:48 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:49 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:50 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:51 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 27.0         |
| 16/04/2010 12:52 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 12:53 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 2.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:54 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 27.1         |
| 16/04/2010 12:55 | 54.4 | 18.5 | 0.0 | 27.1    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 12:56 | 54.3 | 18.5 | 0.0 | 27.2    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.2         |
| 16               |      |      |     |         |          |         |                |              |               |     |      |         |              |

**Note:**  
Internal flow reading was from the start of day.

## Appendix I: Continuous Gas Monitoring Data from BH8

| Date/Time        | CH4  | CO2  | O2  | BALANCE | CH4 %LEL | PEAKCH4 | BARO. PRESSURE | REL.PRESSURE | INTERNAL FLOW | CO  | H2S  | CH4/CO2 | Res Nitrogen |
|------------------|------|------|-----|---------|----------|---------|----------------|--------------|---------------|-----|------|---------|--------------|
|                  | %    | %    | %   | %       | %        | %       | mb             | mb           | l/h           | ppm | ppm  | %       | %            |
| 16/04/2010 13:08 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 27.1         |
| 16/04/2010 13:09 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 2.0 | 11.0 | 2.9     | 27.1         |
| 16/04/2010 13:10 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 13:11 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 13:12 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 13:13 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 13:14 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 13:15 | 54.3 | 18.6 | 0.0 | 27.1    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.1         |
| 16/04/2010 13:16 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:17 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 27.0         |
| 16/04/2010 13:18 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.4    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:19 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:20 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:21 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:22 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:23 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:24 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.9         |
| 16/04/2010 13:25 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:26 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:27 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:28 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:29 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 27.0         |
| 16/04/2010 13:30 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 2.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:31 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 2.0 | 11.0 | 2.9     | 26.9         |
| 16/04/2010 13:32 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.9         |
| 16/04/2010 13:33 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 27.0         |
| 16/04/2010 13:34 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 2.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:35 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.5    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.9         |
| 16/04/2010 13:36 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.9         |
| 16/04/2010 13:37 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.9         |
| 16/04/2010 13:38 | 54.4 | 18.6 | 0.0 | 27.0    | 200.0    | 54.5    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 27.0         |
| 16/04/2010 13:40 | 54.5 | 18.6 | 0.0 | 26.9    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 2.0 | 11.0 | 2.9     | 26.9         |
| 16/04/2010 13:41 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.6    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.8         |
| 16/04/2010 13:42 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.7    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.8         |
| 16/04/2010 13:43 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.7    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.8         |
| 16/04/2010 13:44 | 54.6 | 18.6 | 0.0 | 26.8    | 200.0    | 54.7    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.8         |
| 16/04/2010 13:45 | 54.7 | 18.6 | 0.0 | 26.7    | 200.0    | 54.8    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.7         |
| 16/04/2010 13:46 | 54.7 | 18.6 | 0.0 | 26.7    | 200.0    | 54.8    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.7         |
| 16/04/2010 13:47 | 54.7 | 18.6 | 0.0 | 26.7    | 200.0    | 54.8    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.7         |
| 16/04/2010 13:48 | 54.7 | 18.6 | 0.0 | 26.7    | 200.0    | 54.8    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 2.9     | 26.7         |
| 16/04/2010 13:49 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.8    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 13:50 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 3.0     | 26.6         |
| 16/04/2010 13:51 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 3.0     | 26.6         |
| 16/04/2010 13:52 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 13:53 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 13:54 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 13:55 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.1          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 13:56 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 55.0    | 1025.0         | 1.1          | 0.0           | 3.0 | 10.0 | 3.0     | 26.5         |
| 16/04/2010 13:57 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.5         |
| 16/04/2010 13:58 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.5         |
| 16/04/2010 13:59 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.5         |
| 16/04/2010 14:00 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.5         |
| 16/04/2010 14:01 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.6         |
| 16/04/2010 14:02 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.5         |
| 16/04/2010 14:03 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.5         |
| 16/04/2010 14:04 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.6         |
| 16/04/2010 14:05 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 14:06 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 14:07 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 2.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:08 | 54.8 | 18.6 | 0.0 | 26.6    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.6         |
| 16/04/2010 14:09 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:10 | 54.9 | 18.6 | 0.0 | 26.5    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.5         |
| 16/04/2010 14:11 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:12 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:13 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:14 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:15 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:16 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 54.9    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:17 | 54.9 | 18.7 | 0.0 | 26.4    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.4         |
| 16/04/2010 14:18 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:19 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:20 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 2.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:21 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:22 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:23 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.3         |
| 16/04/2010 14:24 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.0    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:25 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:26 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 2.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:27 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.3         |
| 16/04/2010 14:28 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:29 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 2.0 | 11.0 | 2.9     | 26.3         |
| 16/04/2010 14:30 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.3         |
| 16/04/2010 14:31 | 55.1 | 18.7 | 0.0 | 26.2    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 3.0     | 26.2         |
| 16/04/2010 14:32 | 55.1 | 18.7 | 0.0 | 26.2    | 200.0    | 55.2    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.2         |
| 16/04/2010 14:33 | 55.1 | 18.7 | 0.0 | 26.2    | 200.0    | 55.2    | 1025.0         | 1.0          | 0.0           | 3.0 | 11.0 | 3.0     | 26.2         |
| 16/04/2010 14:34 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.3         |
| 16/04/2010 14:35 | 55.0 | 18.7 | 0.0 | 26.3    | 200.0    | 55.1    | 1025.0         | 1.0          | 0.0           | 3.0 | 10.0 | 2.9     | 26.3         |
| 16               |      |      |     |         |          |         |                |              |               |     |      |         |              |

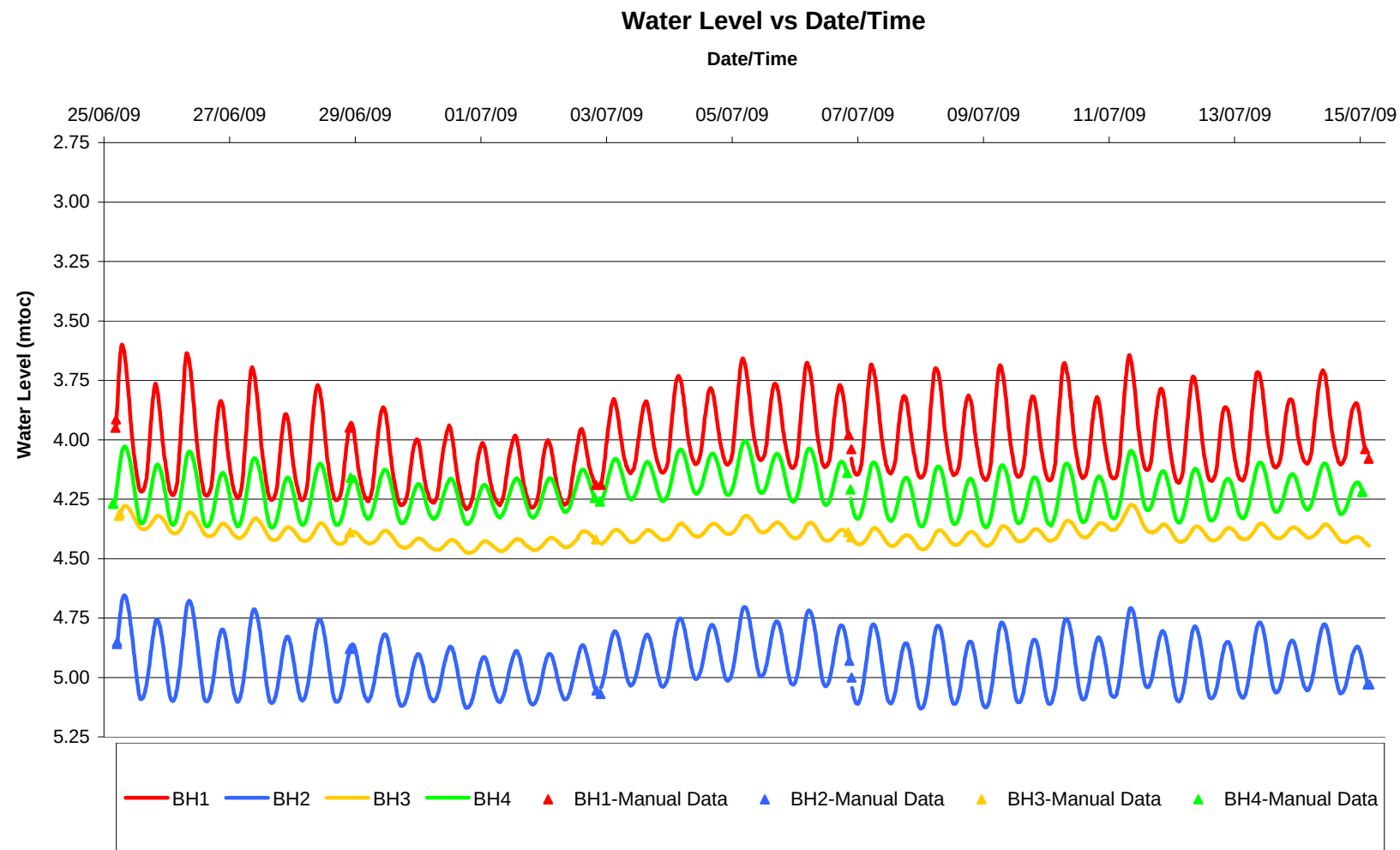
**Note:**  
Internal flow reading was from the start of day.

**Note:**  
Internal flow reading was from the start of day.

**Note:**  
Internal flow reading was from the start of day.

# APPENDIX J

Appendix J: Logger Data - Groundwater Monitoring Wells 2009





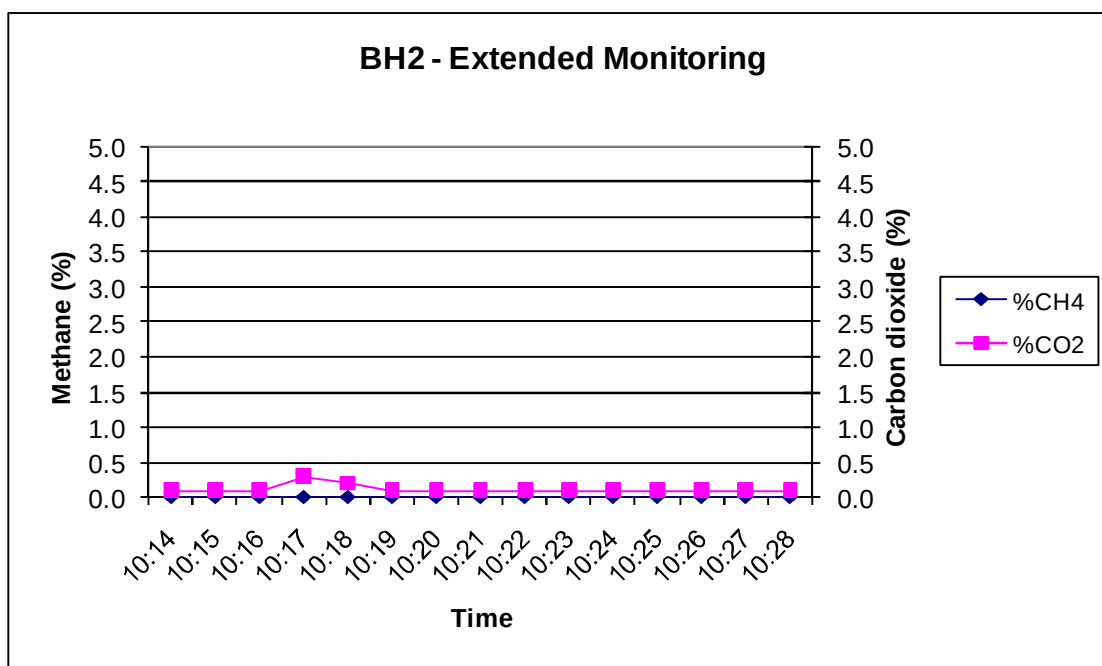
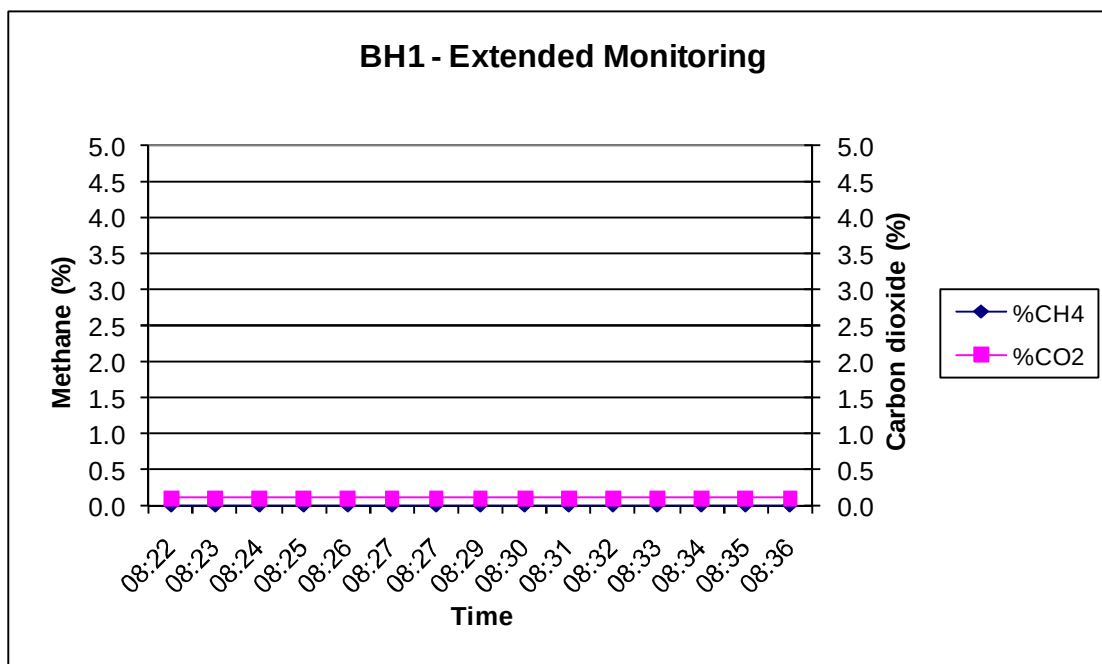
# APPENDIX K



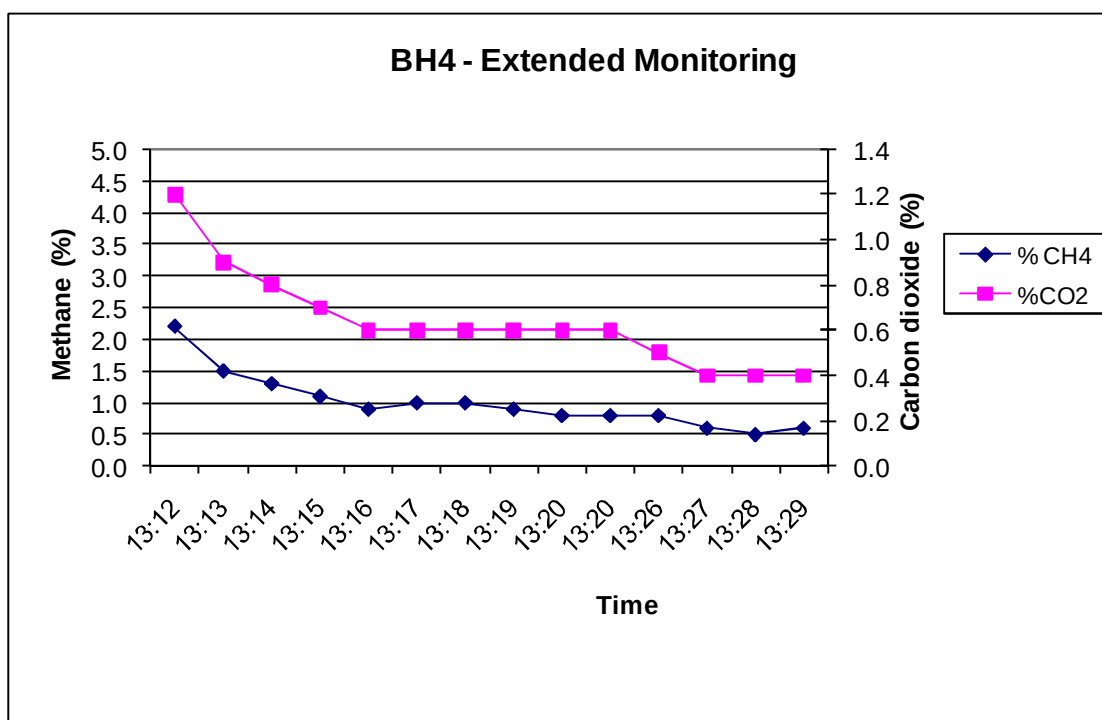
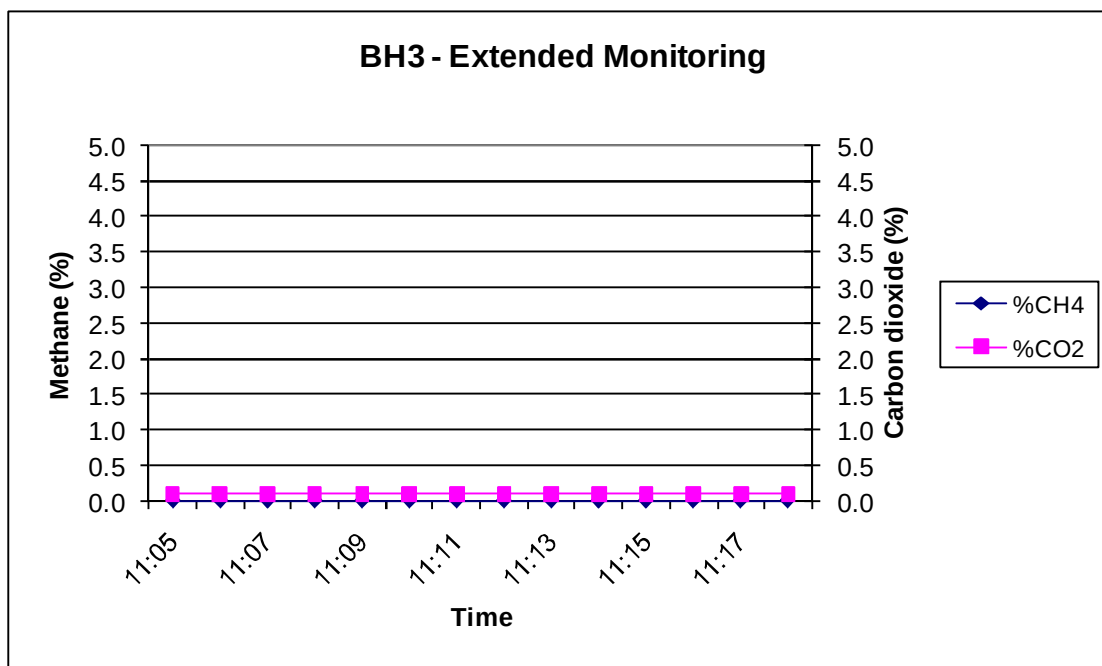


## APPENDIX L

## Appendix L: Extended Gas Monitoring Graphs

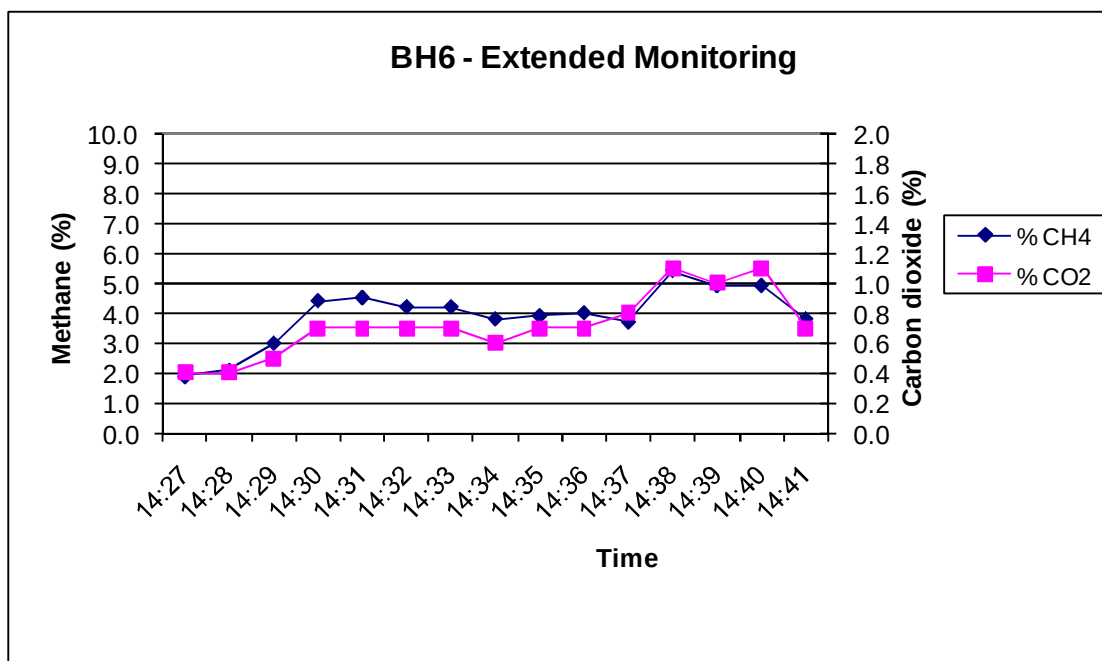
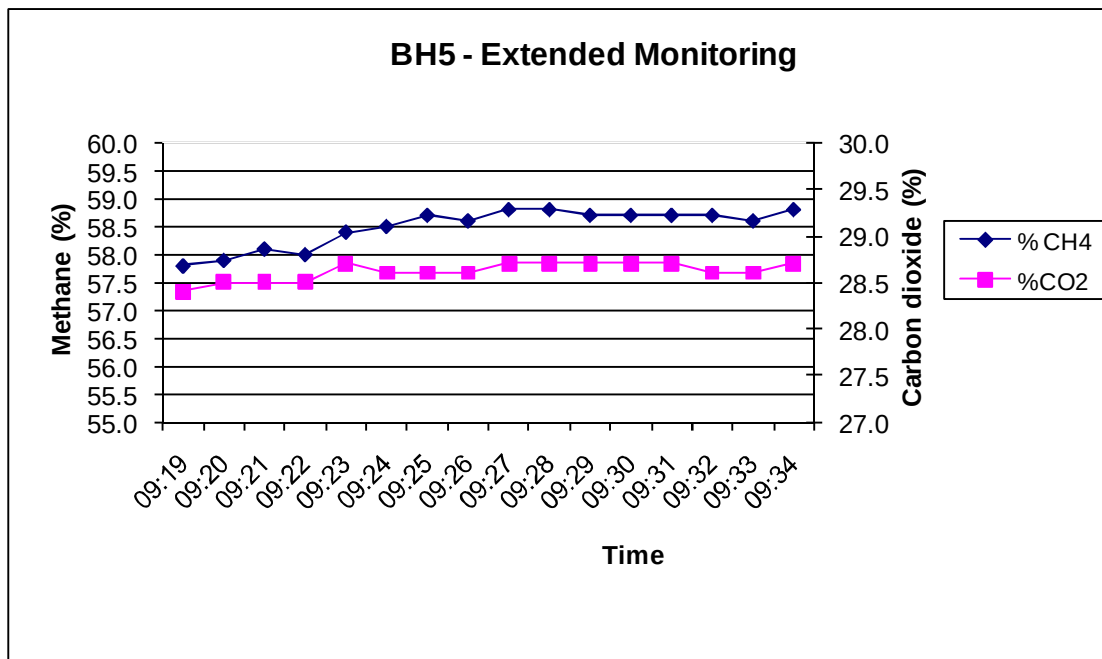


Appendix L: Extended Gas Monitoring Graphs

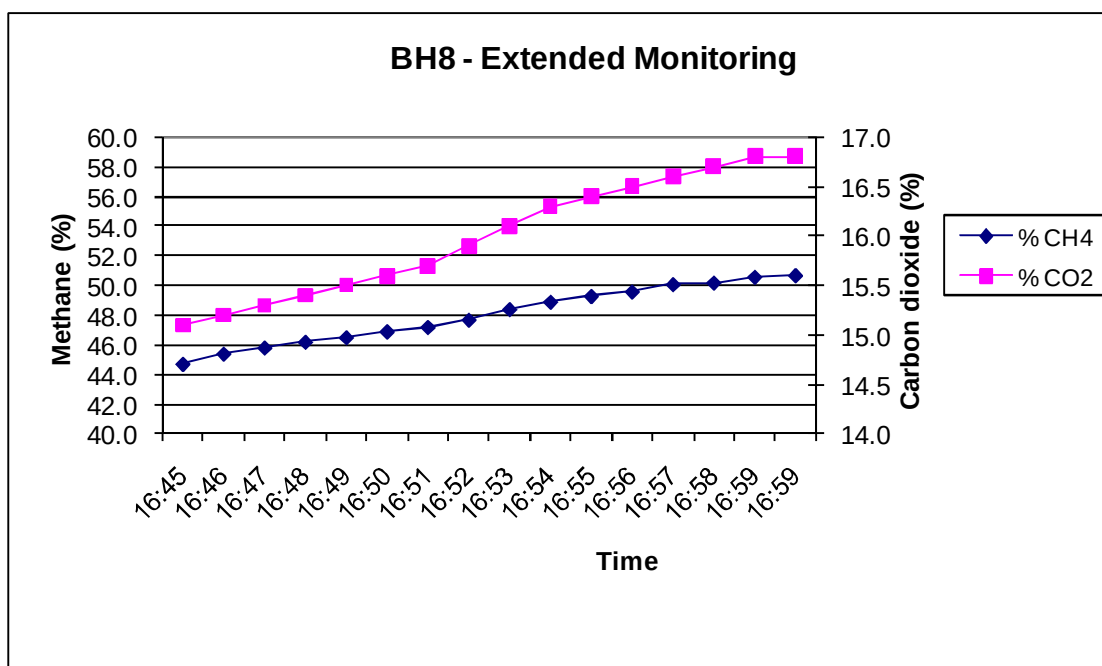
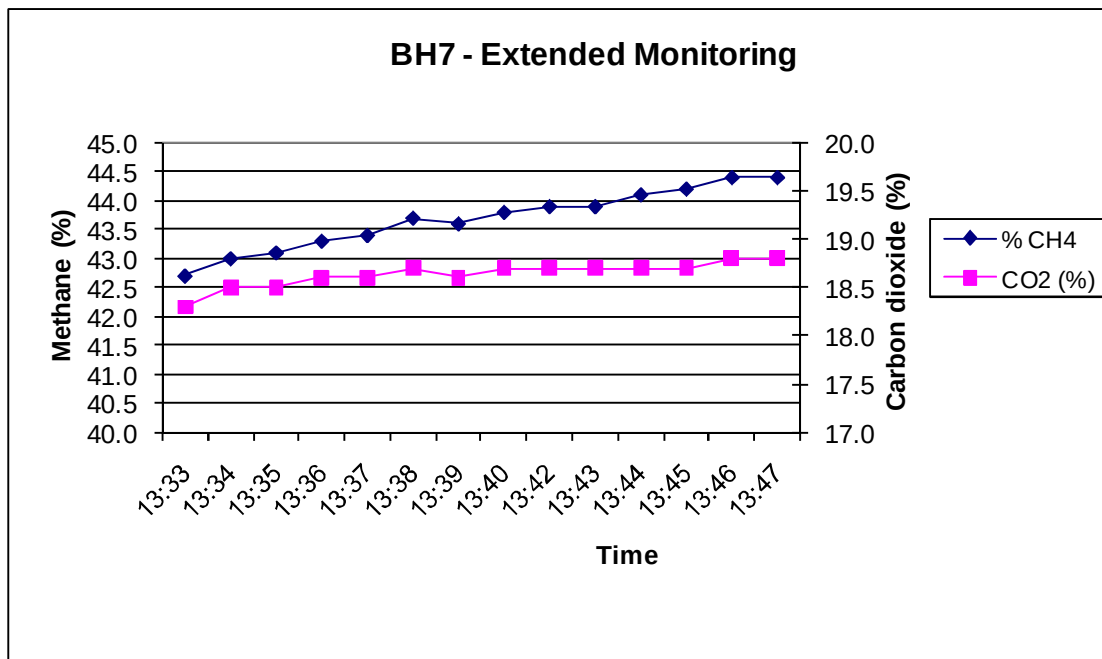




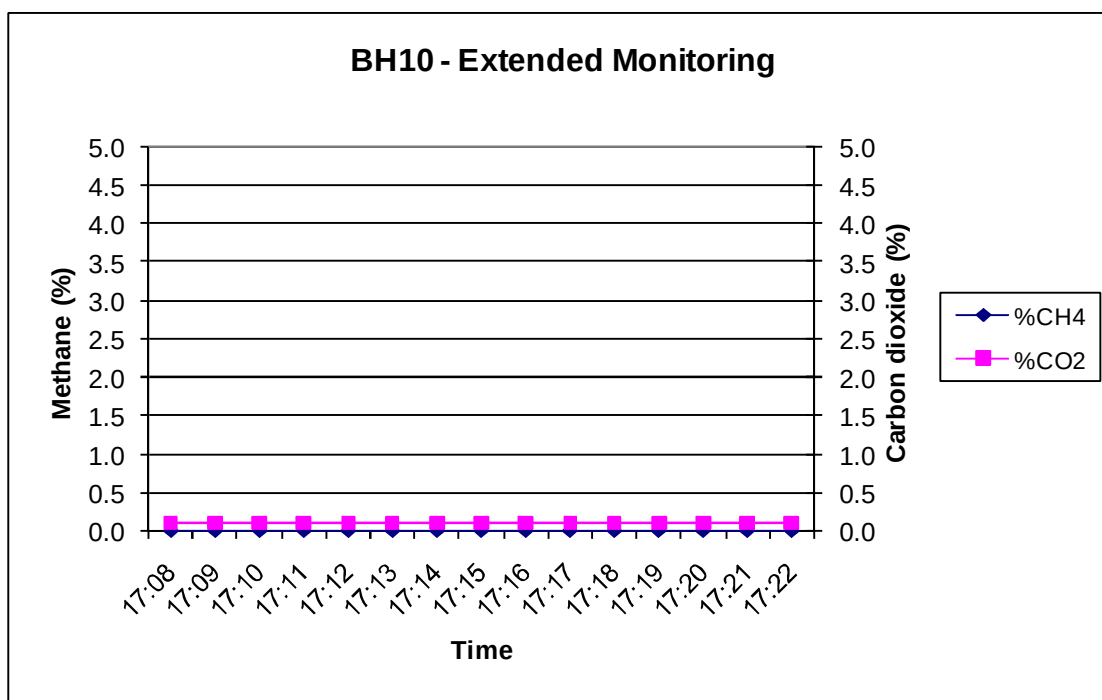
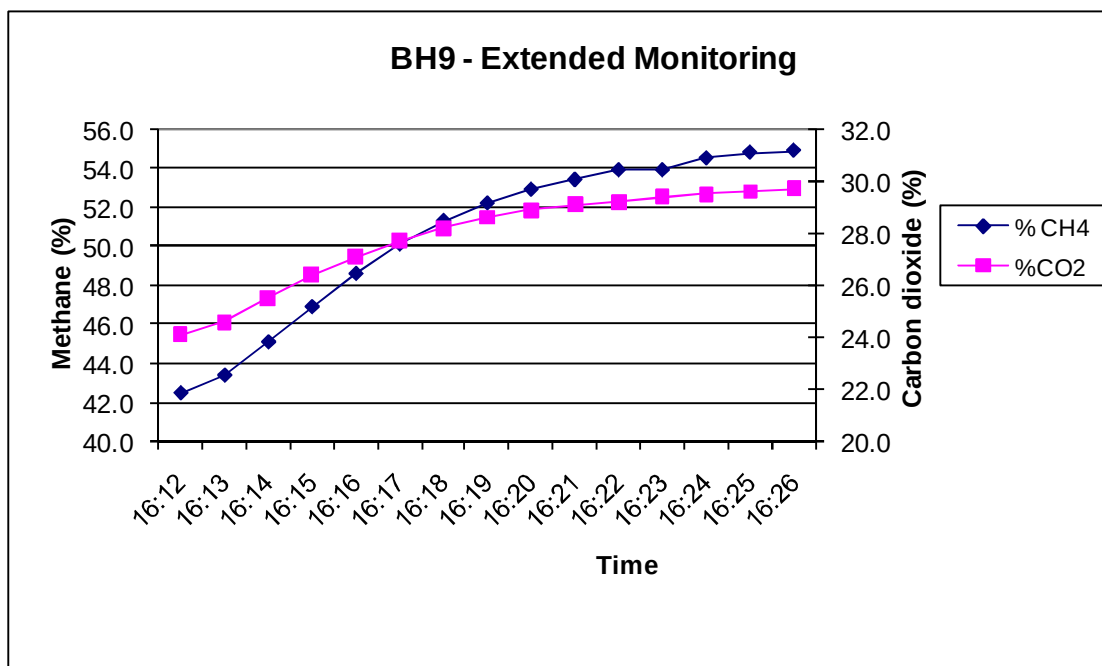
Appendix L: Extended Gas Monitoring Graphs



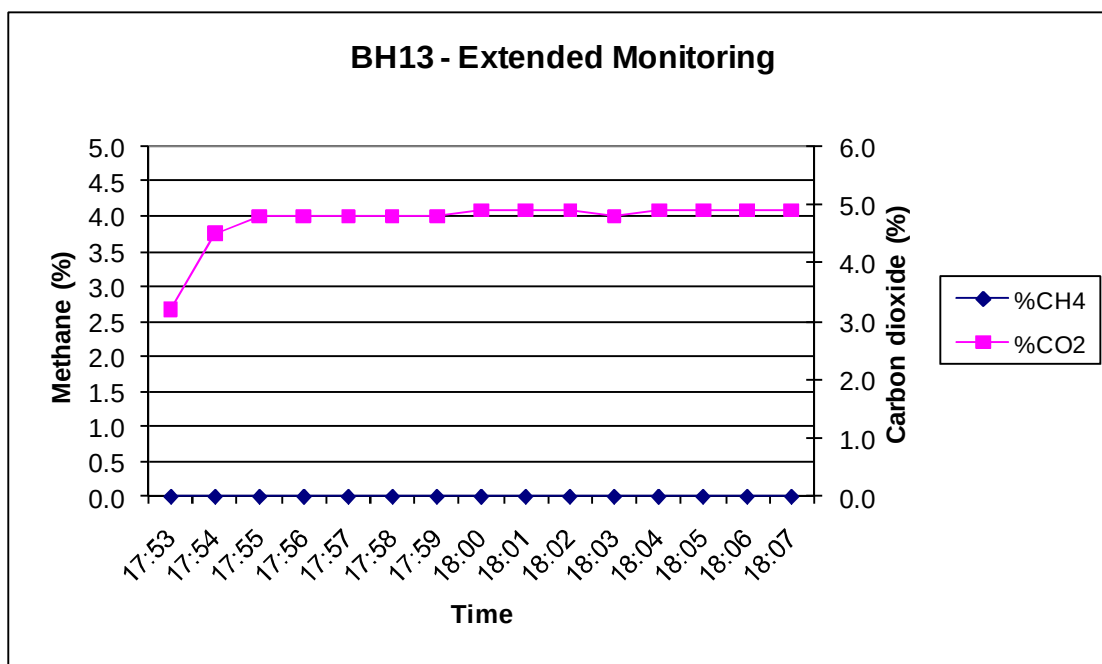
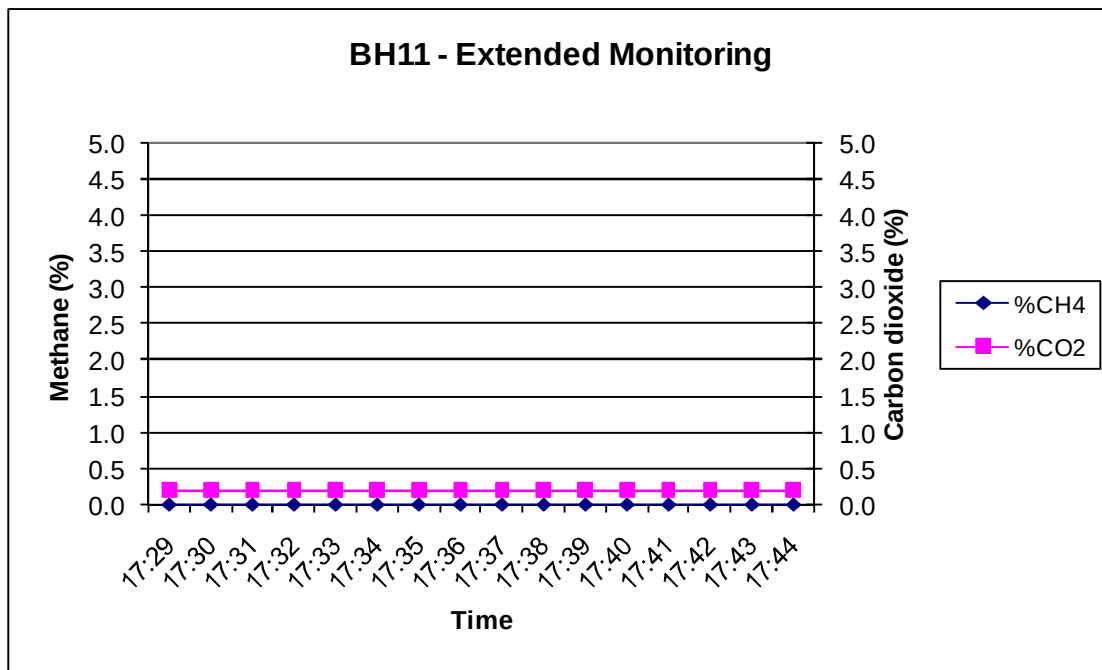
## Appendix L: Extended Gas Monitoring Graphs



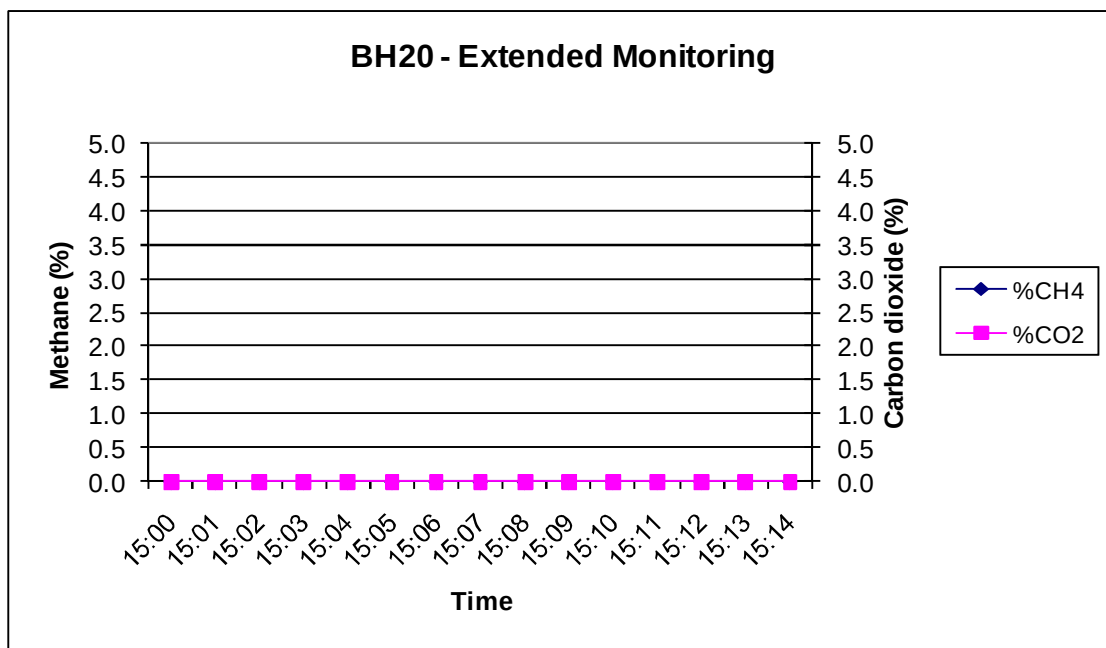
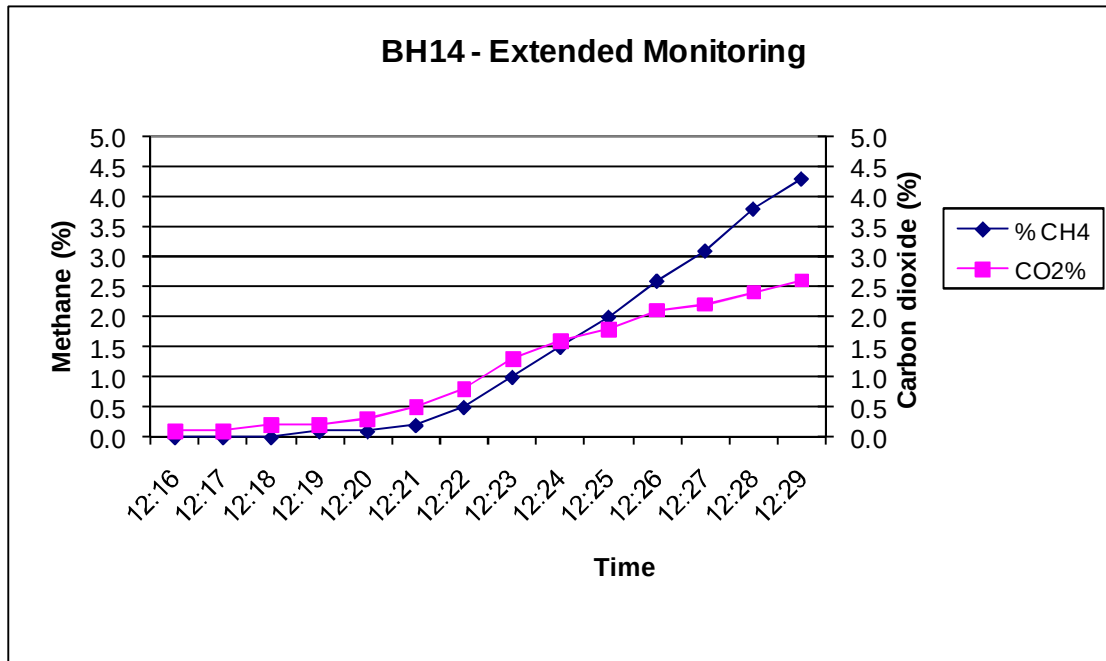
Appendix L: Extended Gas Monitoring Graphs



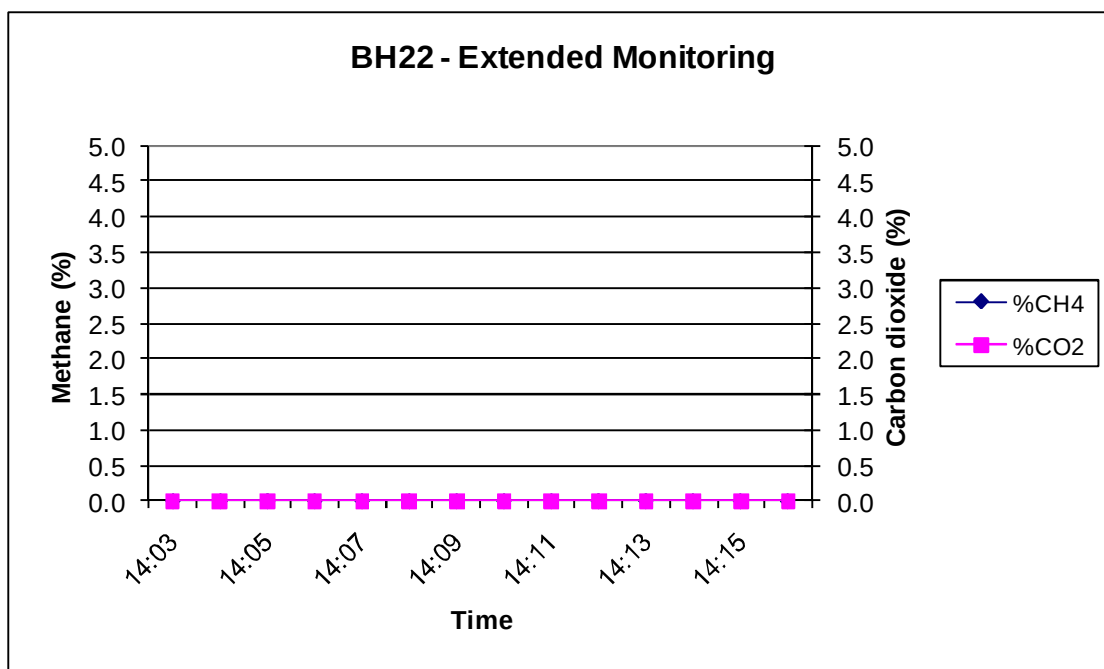
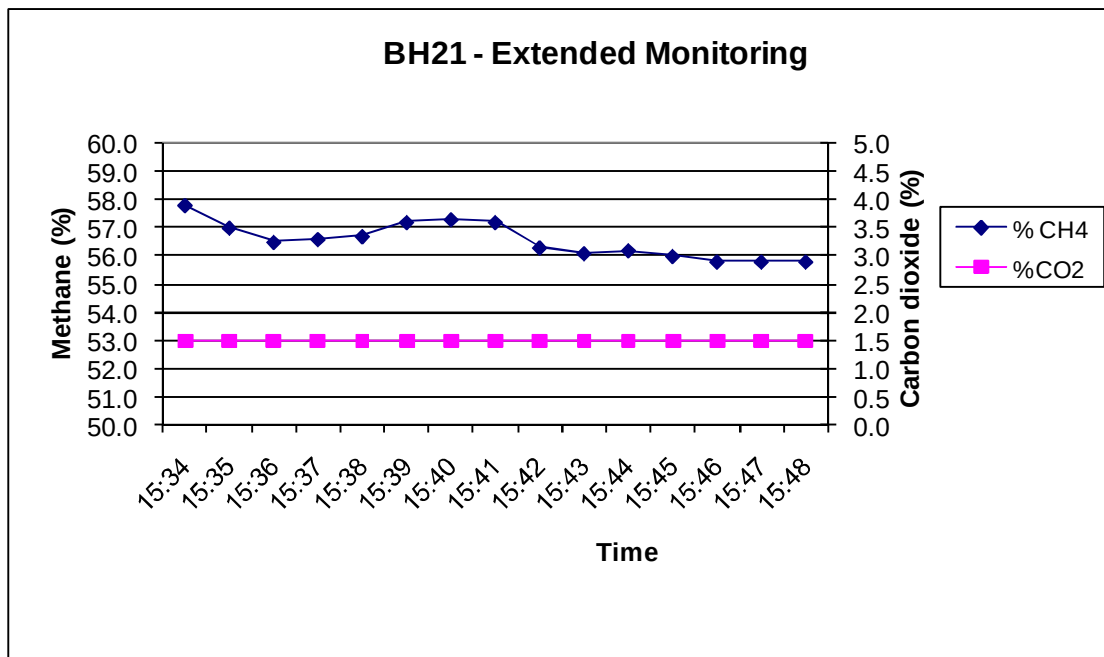
Appendix L: Extended Gas Monitoring Graphs



Appendix L: Extended Gas Monitoring Graphs

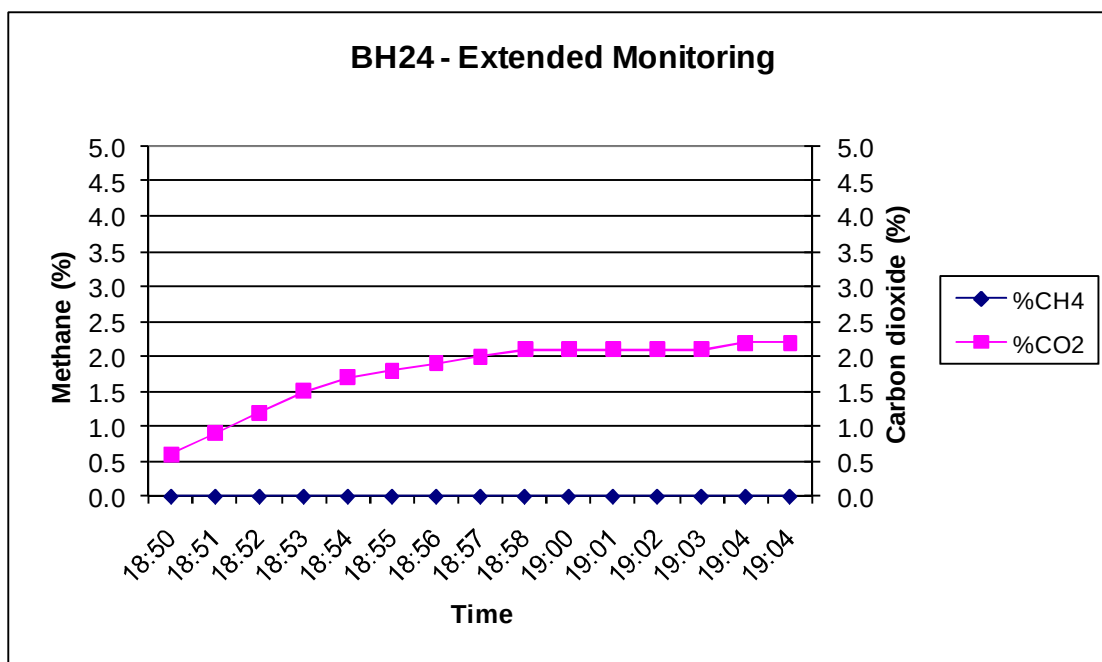
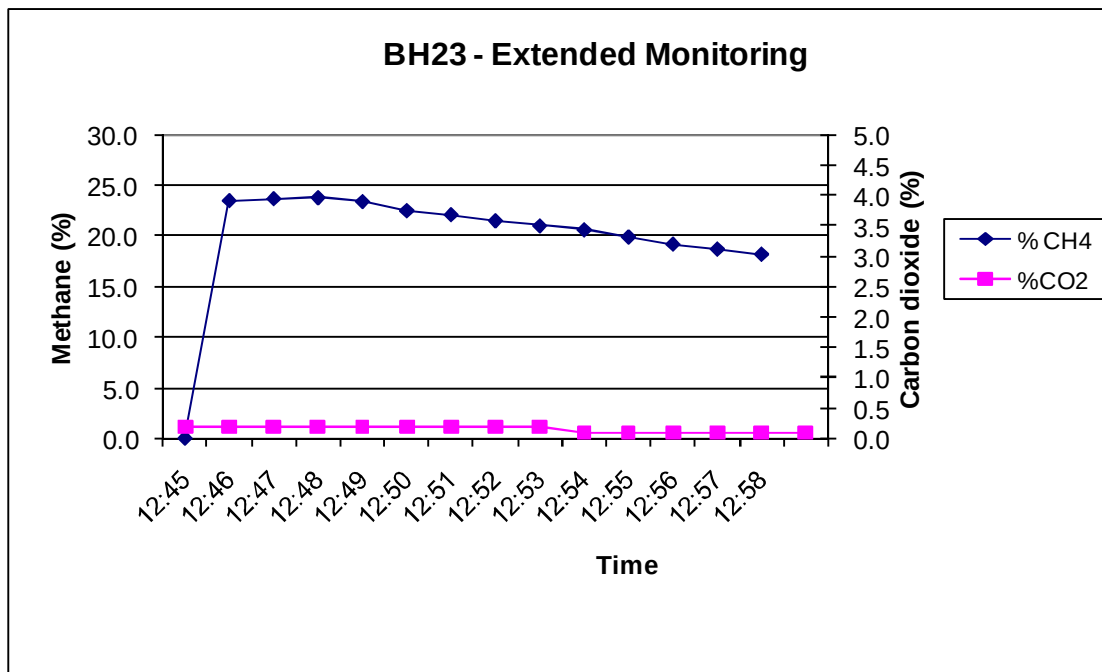


Appendix L: Extended Gas Monitoring Graphs

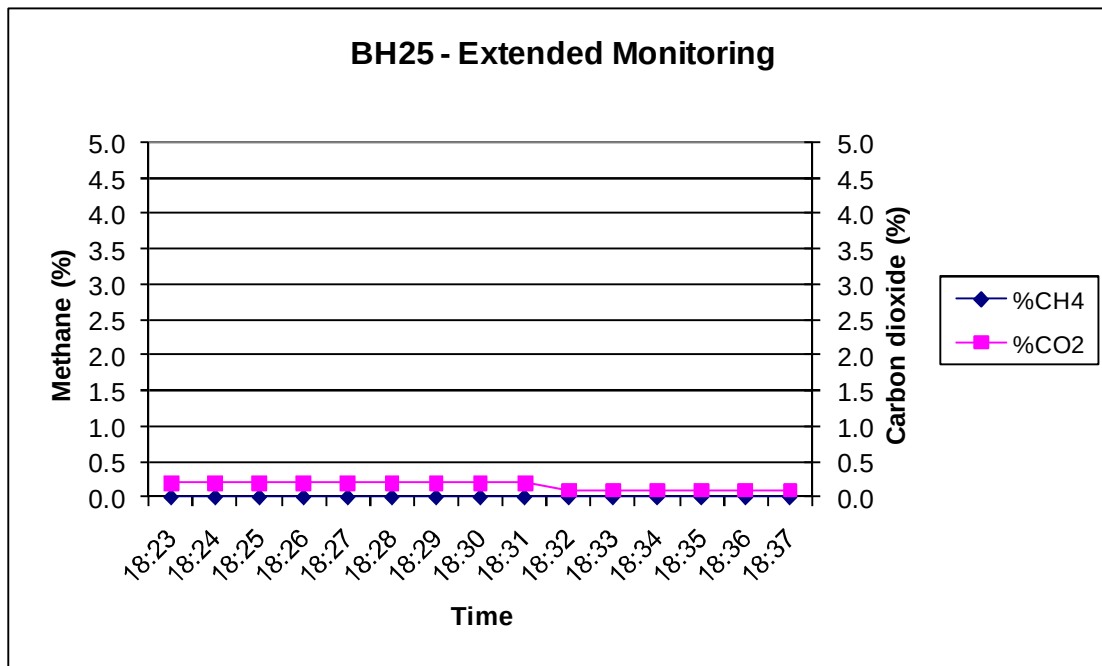




Appendix L: Extended Gas Monitoring Graphs



Appendix L: Extended Gas Monitoring Graphs



# APPENDIX M

## Appendix M

### Table 1: Internal Survey Monitoring Results Event 1

| 19/01/2010                          |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Peter Healy - Tamwell's diesel      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                   | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                     | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                     |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading             | 17:00          | 17:01    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Ambient indoor reading              | 17:01          | 17:02    | 0     | 0        | 0            | 0     | 21.5 | 78.8    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Around indoor perimeter of workshop | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Vehicle maintenance pit #1          | 17:02          | 17:03    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Mens toilet (Ambient reading)       | 17:01          | 17:05    | 0     | 0        | 0            | 0     | 21.8 | 78.8    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Under sink in mens toilet           | 17:05          | 17:06    | 0     | 0        | 0            | 0     | 21.5 | 78.8    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Vehicle maintenance pit #2          | 17:07          | 17:08    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Toolstore                           | 17:09          | 18:10    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Front store                         | 18:11          | 18:12    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Ladies toilet (Ambient)             | 18:12          | 18:13    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Office (Ambient)                    | 18:13          | 18:14    | 0     | 0        | 0            | 0.1/0 | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Canteen                             | 18:14          | 18:15    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Under IBC outside                   | 18:16          | 18:17    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Under trailer/container             | 18:18          | 18:19    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | 0.02              | 0                            | -       | -       |
| Under concrete chunk outside        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |

| 21/01/2010                                |                |          |       |          |              |         |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------|----------------|----------|-------|----------|--------------|---------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Patrick Carty - Euroflow                  |                |          |       |          |              |         |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                         | GA2000 results |          |       |          |              |         |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2   | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                           |                |          |       |          |              |         |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                   | 12:29          | 12:30    | 0     | 0        | 0            | 0.1     | 21.3 | 78.6    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Tank 1                                    | 12:30          | 21:31    | 0     | 0        | 0            | 0.1     | 21.3 | 78.6    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Tank 2                                    | 12:31          | 21:32    | 0     | 0        | 0            | 0.1     | 21.3 | 78.6    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Tank 3                                    | 12:32          | 12:33    | 0     | 0        | 0            | 0.1     | 21.4 | 78.8    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Under construction on stilts              | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Portacabin # 1                            | 12:33          | 12:34    | 0     | 0        | 0            | 0.2/0.1 | 21.3 | 78.6    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Portacabin #1 toilets                     | 12:34          | 12:35    | 0     | 0        | 0            | 0.1     | 21.4 | 78.5    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Toilet waste pipe                         | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sink pipe                                 | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Canteen/kitchen                           | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under portacabin #2                       | 12:35          | 12:36    | 0     | 0        | 0            | 0       | 21.4 | 78.6    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Portacabin # 3                            | 12:37          | 12:38    | 0     | 0        | 0            | 0       | 21.4 | 78.6    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| All around skirting board of cabin 3      | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Hole in floor of cabin 3                  | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under portacabin #3 (part 1)              | 12:38          | 12:39    | 0     | 0        | 0            | 0.1     | 21.4 | 78.5    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Portacabin #3 (part 2)                    | 12:39          | 12:40    | 0     | 0        | 0            | 0.1     | 21.5 | 78.4    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |
| Around skirting board of cabin 3 (part 2) | -              | -        | -     | -        | -            | -       | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ambient                                   | 12:41          | 12:42    | 0     | 0        | 0            | 0       | 21.5 | 78.5    | 0      | 0       | 997                 | -0.17             | 0                            | -       | -       |

| 20/01/2010                          |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Finbarr Sweeny - Maryville          |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                   | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                     | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                     |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Kitchen 1 (ambient)                 | 11:09          | 11:10    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Kitchen 1 around skirting boards    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 2.7     | 3.8     |
| Cupboard under sink in kitchen 1    | 11:10          | 11:11    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1004                | 0.44              | 3.6                          | -       | -       |
| Downstairs bathroom ambient         | 11:11          | 11:12    | 0     | 0        | 0            | 0.1   | 21.6 | 78.4    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Downstairs toilet at waste pipe     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 4.5                          | -       | -       |
| Shower in downstairs bathroom       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 4.1                          | -       | -       |
| Downstairs bathroom sink at pipes   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 4.6                          | -       | -       |
| Kitchen 2 (ambient)                 | 11:12          | 11:13    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Kitchen 2 around skirting board     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 4.5     | 5       |
| Cupboard under sink in kitchen 2    | 11:13          | 11:14    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1004                | 0.44              | 5.2                          | -       | -       |
| Kitchen 3 (ambient)                 | 11:15          | 11:16    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Kitchen 3 around skirting board     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 6.8     | 7.4     |
| Cupboard under sink in kitchen 3    | 11:16          | 11:17    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 10.2                         | -       | -       |
| Hallway between kitchen 2 and 3     | 11:17          | 11:18    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 5.5                          | -       | -       |
| Cupboard under stairs               | 11:19          | 11:20    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1004                | 0.44              | 1                            | -       | -       |
| Sitting room                        | 11:20          | 11:21    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 3.1                          | -       | -       |
| Sitting room around skirting boards | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 3.1     | 4       |
| Sitting room cupboard               | 11:21          | 11:22    | 0     | 0        | 0            | 0     | 21.6 | 78.9    | 0      | 0       | 1004                | 0.44              | 2.9                          | -       | -       |
| Upstairs landing                    | 11:22          | 11:28    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 4.5                          | -       | -       |
| Upstairs shower only                | 11:23          | 11:24    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 4.4                          | -       | -       |
| Sink pipes in upstairs shower room  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 4.6                          | -       | -       |
| Upstairs toilets                    | 11:24          | 11:25    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Upstairs toilets under waste pipe   | 11:25          | 11:26    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1004                | 0.44              | 2.6 (2.7)                    | -       | -       |
| Sinks in upstairs toilet room       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 2.7                          | -       | -       |

**Note:**  
- denotes no reading taken  
\*indicates Ms. Jeanne Dolan's property was surveyed in October 2009. All other properties were surveyed in January 2010.

Appendix M  
Table 1: Internal Survey Monitoring Results Event 1

| 20/01/2010                       |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|----------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Fergus Callaghy - Cosy Stoves    |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                  | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                  |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading          | 11:30          | 11:31    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.44              | 2.2                          | -       | -       |
| Gravel strip outside front door  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.7                          | -       | -       |
| Ambient reading 1 inside         | 11:31          | 11:32    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.44              | 1.6                          | -       | -       |
| Ambient reading 2 inside         | 11:32          | 11:33    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Around skirting board            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.7     | 1.6     |
| Cupboard at rear of shop         | 11:33          | 11:34    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1004                | 0.44              | 9                            | -       | -       |
| Ambient reading 4 inside         | 11:34          | 11:35    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Bathroom (waste pipe at sink)    | 11:36          | 11:37    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.44              | 3                            | -       | -       |
| Toilet at waste pipe             | 11:37          | 11:38    | 0     | 0        | 0            | 0.1   | 21.8 | 78.4    | 0      | 0       | 1004                | 0.44              | 3.1                          | -       | -       |
| Stove pipe in wall               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 2                            | -       | -       |
| Upstairs ambient                 | 11:38          | 11:39    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Around skirting board upstairs   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 2.7     | 3.4     |
| Around skirting board in canteen | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 3.2     | 4.5     |
| Upstairs canteen                 | 11:39          | 11:40    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Under sink in canteen            | 11:40          | 11:41    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.44              | 4.1                          | -       | -       |
| Downstairs office                | 11:41          | 11:42    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.44              | 1.1                          | -       | -       |

| 20/01/2010                          |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Michael Murrick - Senator Windows   |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                   | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                     | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                     |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading             | 12:48          | 12:49    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.42              | 0                            | -       | -       |
| Gravel strip outside front door     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.8     | 2.2     |
| Ambient indoor reading              | 12:49          | 12:50    | 0     | 0        | 0            | 0     | 21.5 | 78.8    | 0      | 0       | 1004                | 0.42              | 3                            | -       | -       |
| Ambient reading in toilet           | 12:50          | 12:51    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.42              | 0.7                          | -       | -       |
| Waste pipe at back of toilet        | 12:51          | 12:52    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1004                | 0.42              | 1.1                          | -       | -       |
| Pipe at back of sink                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Store                               | 12:52          | 12:53    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.42              | 0.5                          | -       | -       |
| Canteen space (under sink in store) | 12:53          | 12:54    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.42              | 4.1                          | -       | -       |
| At rear (outside by manhole)        | 12:54          | 12:55    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.42              | 0.2                          | -       | -       |
| Ambient out the back                | 12:55          | 12:56    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1004                | 0.42              | 0                            | -       | -       |
| Along the gravel strip out the back | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.7     | 1.1     |
| At pipe out the back                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 1.1                          | -       | -       |
| Under skip out the back             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Around skirting board in store      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.7     | 1.2     |

| 20/01/2010                      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|---------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Padraic McGowan - Taurus        |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed               | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                 | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                 |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Shop ambient reading            | 12:08          | 21:09    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1004                | 0.42              | 3.2                          | -       | -       |
| Reading around skirting boards  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 4.9     |
| Under shelves                   | 12:09          | 12:10    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1004                | 0.42              | 0                            | -       | -       |
| Toilet (ambient)                | 12:11          | 12:12    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1004                | 0.42              | 1.3                          | -       | -       |
| Toilet at waste pipe            | 12:10          | 12:11    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1004                | 0.42              | 5                            | -       | -       |
| At back of sink                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 2.8                          | -       | -       |
| Shop under                      | 12:12          | 12:13    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1004                | 0.42              | 0                            | -       | -       |
| Shop second ambient reading     | 12:13          | 12:14    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1004                | 0.42              | 0                            | -       | -       |
| Under pallents under the stairs | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 2.5                          | -       | -       |

| 20/01/2010                                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ann Casey - Shalomar                      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                   | 14:49          | 14:50    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1006                | -0.06             | 0                            | -       | -       |
| Entrance hallway                          | 14:50          | 14:51    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1006                | -0.06             | 0                            | -       | -       |
| Around skirting board in entrance hallway | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| TV Room/Lounge                            | 14:51          | 14:52    | 0     | 0        | 0            | 0/0.1 | 21.1 | 78.9/8  | 0      | 0       | 1006                | -0.06             | 0                            | -       | -       |
| Around skirting board in TV room          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Bedroom with ensuite                      | 14:52          | 14:53    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1006                | -0.06             | 0                            | -       | -       |
| Around skirting board in bedroom          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ensuite (ambient)                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ensuite under sink                        | 14:53          | 14:53    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1006                | -0.06             | 0                            | -       | -       |
| Ensuite at toilet waste pipe              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Hallway                                   | 14:52          | 14:53    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1006                | 0.01              | 0                            | -       | -       |
| Smoking room                              | 14:53          | 14:54    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | 0.01              | 0                            | -       | -       |
| Around skirting board in smoking room     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Bedroom No. 1                             | 14:54          | 14:55    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | 0.01              | 0                            | -       | -       |
| Store                                     | 14:56          | 14:57    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Around skirting board in store            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Dining area of kitchen                    | 14:57          | 14:58    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Around skirting board in dining area      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Cooking area of kitchen                   | 14:58          | 14:59    | 0     | 0        | 0            | 0.1/0 | 21.3 | 78.7    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Around skirting board in cooking area     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under sink in cooking area                | 14:59          | 15:00    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Back kitchen                              | 15:00          | 15:01    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Under sink in back kitchen                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toilet (ambient)                          | 15:01          | 15:02    | 0     | 0        | 0            | 0.1   | 21.3 | 78.7    | 0      | 0       | 1006                | 0.08              | 0.4                          | -       | -       |
| At pipes under sink                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toilet at waste pipe                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Shower room (ambient)                     | 15:03          | 15:04    | 0     | 0        | 0            | 0.1   | 21.3 | 78.7    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Sink in shower room                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Reception (ambient)                       | 15:04          | 15:05    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Activities/games room                     | 15:05          | 15:06    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.08              | 0                            | -       | -       |
| Around skirting board in activites room   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| External store                            | 15:06          | 15:07    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | 0.08              | 0.2                          | -       | -       |

| 20/01/2010                                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ronnie Dunne - Calor Gas                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                   | 16:15          | 16:16    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Reception office (ambient)                | 16:16          | 16:17    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Around skirting board in reception office | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toilet                                    | 16:17          | 16:18    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Toilet at waste pipe                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| At pipes under sink                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Canteen/kitchen                           | 16:18          | 16:19    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Sink                                      | 16:20          | 16:21    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| In shower in bathroom                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pump house                                | 16:21          | 16:22    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Around perimeter in pump house            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under blue container                      | 16:22          | 16:23    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Brown side tin shed                       | 16:23          | 16:24    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Gantry                                    | 16:24          | 16:25    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |
| Telephone box                             | 16:25          | 16:20    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | -0.07             | 0                            | -       | -       |

Appendix M  
Table 1: Internal Survey Monitoring Results Event 1

| 20/01/2010                                    |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Declan Caslin - Hunter's Coals                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                             | GA2000 results |          |       |          |              |       |      |         |        |         |                     | MicroFID results  |                              |         |         |
|                                               | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                               |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient reading external to site              | 08:37          | 08:38    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1002                | -0.14             | 0                            | -       | -       |
| Crack (1) outside of shed (A)                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Corner of front building (location 1)         | 08:38          | 08:40    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1002                | -0.14             | 0                            | -       | -       |
| Under door of shed (A) with no access         | 08:40          | 08:41    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1002                | -0.14             | 5.0                          | -       | -       |
| Under green container                         | 08:41          | 08:43    | 0     | 0        | 0            | 0/0.1 | 21.5 | 78.8    | 0      | 0       | 1002                | -0.14             | 0                            | -       | -       |
| Scales/weighing room                          | 08:45          | 08:46    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | -0.14             | 0                            | -       | -       |
| Pump room                                     | 08:46          | 08:47    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1002                | -0.14             | 0                            | -       | -       |
| Around indoor perimeter of pump room          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Foot of gantry                                | 08:48          | 08:49    | 0     | 0        | 0            | 0     | 21.7 | 78.3    | 0      | 0       | 1002                | -0.14             | 0.7                          | -       | -       |
| Ambient reading (location 3)                  | 08:50          | 08:52    | 0     | 0        | 0            | 0     | 21.7 | 78.3    | 0      | 0       | 1002                | 0.06              | 0                            | -       | -       |
| Drain 1                                       | 08:53          | 08:54    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1002                | 0.06              | 7.0                          | -       | -       |
| Cracks in ground                              | 08:54          | 08:55    | 0     | 0        | 0            | 0.01  | 21.8 | 78.2    | 0      | 0       | 1002                | 0.06              | 6.0                          | -       | -       |
| Packing plant (shed B) Ambient                | 08:55          | 08:57    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1002                | 0.06              | 0                            | -       | -       |
| Packing plant (shed B) around perimeter       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Packing plant (shed B) under shelves          | 08:57          | 08:58    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1002                | 0.06              | -                            | 0       | 0.4     |
| Tool shed in shed B                           | 08:58          | 08:59    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1002                | 0.06              | -                            | 0       | 4.0     |
| Drain 2                                       | 08:59          | 09:00    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1002                | 0.06              | 13.1                         | -       | -       |
| Canteen                                       | 09:00          | 09:02    | 0     | 0        | 0            | 0.1   | 21.8 | 78.1    | 0      | 0       | 1002                | 0.06              | 0                            | -       | -       |
| In cupboard under sink                        | 09:02          | 09:04    | 0     | 0        | 0            | 0.1   | 21.7 | 78.2    | 0      | 0       | 1002                | 0.06              | 0                            | -       | -       |
| Office                                        | 10:06          | 10:08    | 0     | 0        | 0            | 0.1   | 19   | 80.9    | 0      | 0       | 1004                | 0.17              | 0                            | -       | -       |
| Around skirting board of office               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Kitchen                                       | 10:08          | 10:10    | 0     | 0        | 0            | 0     | 19.1 | 80.9    | 0      | 0       | 1004                | 0.17              | 0                            | -       | -       |
| Kitchen (under sink)                          | 10:10          | 10:12    | 0     | 0        | 0            | 0     | 19.1 | 80.9    | 0      | 0       | 1004                | 0.17              | 0                            | -       | -       |
| Mens toilet (under)                           | 10:12          | 10:13    | 0     | 0        | 0            | 0     | 19.1 | 80.9    | 0      | 0       | 1004                | 0.17              | 0                            | -       | -       |
| Mens toilet at waste pipe                     | 10:13          | 10:15    | 0     | 0        | 0            | 0     | 19.1 | 80.9    | 0      | 0       | 1004                | 0.17              | -                            | 0       | 5.0     |
| Ladies toilet (Ambient)                       | 10:15          | 10:17    | 0     | 0        | 0            | 0/0.1 | 19.2 | 80.8    | 0      | 0       | 1004                | 0.17              | 0                            | -       | -       |
| Ladies toilet around pipes and skirting board | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |

| 21/01/2010                            |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|---------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Sinead O'Hara - Erin Recyclers        |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                     | GA2000 results |          |       |          |              |       |      |         |        |         |                     | MicroFID results  |                              |         |         |
|                                       | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                       |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading               | 11:37          | 11:38    | 0     | 0        | 0            | 0.1   | 20.7 | 79.2    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Reception                             | 11:38          | 11:39    | 0     | 0        | 0            | 0.2   | 20.7 | 79.1    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Reception hall (ambient)              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception #2                          | 11:39          | 11:40    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Reception #2 around skirting board    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Store (ambient)                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Hall                                  | 11:40          | 11:41    | 0     | 0        | 0            | 0.1   | 20.9 | 79      | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Hall skirting board                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ladies toilets                        | 11:41          | 11:42    | 0     | 0        | 0            | 0.1   | 20.9 | 79      | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Toilet                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Sink                                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Back office                           | 11:42          | 11:43    | 0     | 0        | 0            | 0.1   | 20.9 | 79      | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Gents toilets                         | 11:43          | 11:44    | 0     | 0        | 0            | 0.1   | 20.9 | 79      | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Toilet at waste pipe                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Toilet at sink pipe                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Kitchen (ambient)                     | 11:44          | 11:45    | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Kitchen (under sink)                  | 11:45          | 11:46    | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Around skirting board in kitchen      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office at front (ambient)             | 11:46          | 11:47    | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Office at front skirting board        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Front shed location 1                 | 11:47          | 11:48    | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Front shed location 2                 | 11:48          | 11:49    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Front shed location 3                 | 11:49          | 11:50    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Around inside perimeter of front shed | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Maintenance pit                       | 11:50          | 11:51    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Workshop/toolshed                     | 11:51          | 11:52    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Around inside perimeter of tool shed  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Hole in ground                        | 11:52          | 11:53    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Hole location two                     | 11:55          | 11:56    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Under skip                            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under container                       | 11:57          | 11:58    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Back garage                           | 11:58          | 11:59    | 0     | 0        | 0            | 0     | 21.3 | 70.7    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Back garage trench                    | 11:59          | 12:00    | 0     | 0        | 0            |       | 21.3 | 78.7    | 0      | 0       | 998                 | -0.46             | 0                            | -       | -       |
| Crack in floor of garage              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |

| 20/01/2010                                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |             |             |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|-------------|-------------|
| Darragh Quinn - Sligo Fuels               |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |             |             |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     | MicroFID results  |                              |             |             |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |             |             |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stationary reading           | Minimum CH4 | Maximum CH4 |
| Ambient outdoor reading                   | 16:35          | 16:36    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | -0.07             | 0.6                          | -           | -           |
| Crack in ground outside                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Drain by diesel                           | 16:37          | 16:38    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | -0.07             | 0.1                          | -           | -           |
| Under blue truck                          | 16:38          | 16:39    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | -0.07             | 0.2                          | -           | -           |
| Under red storage container               | 16:39          | 16:40    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| In red storage container                  | 16:40          | 16:41    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Around inside perimeter of red container  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Under blue storage container              | 16:41          | 16:42    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Around inside perimeter of blue container | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| In blue storage container                 | 16:42          | 16:43    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Toilet                                    | 16:43          | 16:44    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Main office                               | 16:44          | 16:45    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Around skirting board of main office      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Second office                             | 16:45          | 16:46    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Kitchen (ambient)                         | 16:46          | 16:47    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |
| Around skirting board in kitchen          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Kitchen (under sink)                      | 16:47          | 16:48    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1006                | -0.07             | 0                            | -           | -           |

**Note:**  
- denotes no reading taken  
\*indicates Ms. Jeanne Dolan's property was surveyed in October 2009. All other properties were surveyed in January 2010.



Appendix M  
Table 1: Internal Survey Monitoring Results Event 1

| 19/01/10 and 21/01/10                     |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Aiden McGloin - Celtic Anglian Water Ltd  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                   | 12:53          | 12:54    | 0     | 0        | 0            | 0     | 18.8 | 81.2    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Entrance hallway                          | 12:54          | 12:55    | 0     | 0        | 0            | 0.1   | 19.1 | 80.8    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Around skirting board in entrance hallway | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.8     |
| Women's toilet (Ambient)                  | 12:56          | 12:57    | 0     | 0        | 0            | 0     | 19.3 | 80.7    | 0      | 0       | 1006                | 0.09              | 0.4                          | -       | -       |
| Women's toilet at sink pipe               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.6                          | -       | -       |
| Women's toilet at waste pipe              | 12:57          | 12:58    | 0     | 0        | 0            | 0.1   | 19.3 | 80.6    | 0      | 0       | 1006                | 0.09              | 0.6                          | -       | -       |
| Around toilet at skirting board           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.9     | 1.1     |
| Main hallway                              | 12:58          | 12:59    | 0     | 0        | 0            | 0     | 19.6 | 80.4    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Around skirting board in hall             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.7     |
| Lab                                       | 13:00          | 13:01    | 0     | 0        | 0            | 0     | 19.7 | 80.3    | 0      | 0       | 1006                | 0.09              | 0.8                          | -       | -       |
| Around skirting board in lab              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 1.3     |
| By fridge and sink (crack)                | 13:02          | 13:02    | 0     | 0        | 0            | 0     | 19.8 | 80.2    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Canteen (Ambient)                         | 13:03          | 13:04    | 0     | 0        | 0            | 0     | 19.9 | 80.1    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Canteen (under sink)                      | 13:04          | 13:05    | 0     | 0        | 0            | 0     | 19.9 | 80.1    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Around skirting board in canteen          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.7     |
| Storage                                   | 13:06          | 13:08    | 0     | 0        | 0            | -     | 20.2 | 79.8    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Storage cupboard (Health and Safety)      | 13:09          | 13:10    | 0     | 0        | 0            | 0.1   | 20.2 | 79.7    | 0      | 0       | 1006                | 0.09              | 0.8                          | -       | -       |
| Office 1 (ambient)                        | 13:10          | 13:12    | 0     | 0        | 0            | 0.1   | 20.2 | 79.7    | 0      | 0       | 1006                | 0.09              | 0.7                          | -       | -       |
| Office 1 around skirting board            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.5     | 1.7     |
| Office 2 at skirting board                | 13:12          | 13:14    | 0     | 0        | 0            | 0.1   | 20.2 | 79.7    | 0      | 0       | 1006                | 0.09              | -                            | 0.6     | 0.9     |
| Ambient                                   | 13:14          | 13:15    | 0     | 0        | 0            | 0     | 20.5 | 79.5    | 0      | 0       | 1006                | 0.09              | 1.7                          | -       | -       |
| Locker room (ambient)                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.5                          | -       | -       |
| Generator                                 | 13:15          | 13:15    | 0     | 0        | 0            | 0     | 20.5 | 79.4    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Screening room                            | 13:16          | 13:17    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Cofley construction                       | 13:18          | 13:20    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Sludge dewatering buffer                  | 13:20          | 13:21    | 0     | 0        | 0            | 0     | 21   | 79      | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| UV plant                                  | 13:22          | 13:25    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |
| Cable duct                                | 13:33          | 13:34    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1006                | 0.09              | 0                            | -       | -       |

| 20/01/2010                       |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|----------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Paul McGoldrick - Cold Chon      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                  | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                  |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading          | 12:28          | 12:29    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | 0.45              | 0.8                          | -       | -       |
| Office/reception ambient         | 12:39          | 12:40    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.45              | 24.1                         | -       | -       |
| Kitchen (ambient)                | 12:40          | 12:41    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.45              | 23                           | -       | -       |
| Around skirting board in kitchen | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 22.3    | 22.8    |
| Kitchen (under sink)             | 12:41          | 12:42    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.45              | 21.2                         | -       | -       |
| Toilet ambient                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 35.1                         | -       | -       |
| Toilet under sink                | 12:42          | 12:43    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1006                | 0.45              | 32.6                         | -       | -       |
| Toilet at waste pipe             | 12:43          | 12:44    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1006                | 0.45              | 34.8                         | -       | -       |
| Computer network room            | 12:44          | 12:45    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1006                | 0.45              | 23.5                         | -       | -       |
| Main office                      | 12:54          | 12:46    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1006                | 0.45              | 23.3                         | -       | -       |
| Light outside                    | 12:47          | 12:48    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Crack in ground outside          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Maintenance shed                 | 12:48          | 12:49    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Vehicle maintenance pit          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Shed/store                       | 12:49          | 12:50    | 0     | 0        | 0            | 0     | 20.6 | 78.6    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Diesel tank                      | 12:50          | 12:51    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Production plant                 | 12:51          | 12:52    | 0     | 0        | 0            | 0     | 21.7 | 78.3    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Production plant control room    | 12:52          | 12:53    | 0     | 0        | 0            | 0     | 21.7 | 78.3    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Lab (ambient)                    | 12:53          | 12:54    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Lab (under sink)                 | 12:54          | 12:55    | 0     | 0        | 0            | 0     | 21.8 | 78.2    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Reception to sales office        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sales office                     | 12:49          | 12:50    | 0     | 0        | 0            | 0.1   | 21.8 | 78.1    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Store                            | 12:50          | 12:51    | 0     | 0        | 0            | 0.1   | 21.8 | 78.1    | 0      | 0       | 1006                | 0.45              | 0                            | -       | -       |
| Store skirting board             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Locker in store                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sales office skirting board      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |

| 20/01/2010                                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Barry Gallagher - Greenstar                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                          | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                            | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                            |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception hall (Ambient)                   | 10:27          | 10:29    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1004                | 0.17              | 0                            | -       | -       |
| Reception hall around skirting board       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | 0       | 1.1     |
| ESB Room                                   | 10:29          | 10:37    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1004                | 0.44              | 1.1                          | -       | -       |
| Canteen (Ambient)                          | 10:37          | 10:39    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Canteen around skirting boards             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.7     |
| Canteen cupboard under sink                | 10:39          | 10:41    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1004                | 0.44              | 0.2                          | -       | -       |
| Toilets (Ambient)                          | 10:41          | 10:43    | 0     | 0        | 0            | 0.1/0 | 20.7 | 79.2    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Toilets at waste pipe                      | 10:43          | 10:44    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1004                | 0.44              | -                            | 0       | 1.3     |
| Changing room                              | 10:45          | 10:47    | 0     | 0        | 0            | 0.1   | 20.7 | 79.2    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Around changing/locker room skirting board | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.9     |
| Waste depot (shed 1)                       | 10:47          | 10:48    | 0     | 0        | 0            | 0     | 20.8 | 79.2    | 0      | 0       | 1004                | 0.44              | 1.3                          | -       | -       |
| Crack at back of fish meal store (shed 2)  | 10:48          | 10:45    | 0     | 0        | 0            | 0     | 21   | 79      | 0      | 0       | 1004                | 0.44              | 0.7                          | -       | -       |
| Extension to shed 2-front room             | 10:49          | 10:50    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Small room in extension                    | 10:50          | 10:51    | 0     | 0        | 0            | 0     | 21.4 | 78.8    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Second small room                          | 10:51          | 10:52    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1004                | 0.44              | 0                            | -       | -       |
| Third small room                           | 10:52          | 10:53    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1044                | 0.44              | 0                            | -       | -       |
| Fishmeal store (ambient)                   | 10:53          | 10:54    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1044                | 0.44              | 0                            | -       | -       |
| Fishmeal store (second ambient reading)    | 10:54          | 10:55    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1044                | 0.44              | 0                            | -       | -       |
| Fishmeal store toilets                     | 10:57          | 10:58    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1044                | 0.44              | 0                            | -       | -       |
| Drain outside waste depot (shed 1)         | -              | -        | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1044                | 0.44              | 0                            | -       | -       |
| Under blue container                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |

| 07/10/2009                       |                |          |       |          |              |       |      |         |        |         |                     |                   |
|----------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|
| Ms. Jeanne Dolan                 |                |          |       |          |              |       |      |         |        |         |                     |                   |
| Location Surveyed                | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   |
|                                  | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure |
| Entrance to cul de sac (ambient) | 11:10          | 11:11    | 0     | 0        | 0            | 0     | 21   | 79      | 0      | 0       | 1010                | -0.02             |
| Front room #1                    | -              | -        | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 1010                | -0.02             |
| Front room #2                    | -              | -        | 0     | 0        | 0            | 0.1   | 21   | 79      | 0      | 0       | 1010                | -0.02             |
| Front room skirting              | -              | -        | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 1010                | -0.02             |
| Under stairs #1                  | -              | -        | 0     | 0        | 0            | 0.1   | 21   | 79      | 0      | 0       | 1010                | -0.02             |
| Under stairs #2                  | -              | -        | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 1010                | -0.02             |
| Hall                             | -              | -        | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1010                | -0.02             |
| Small back room with shelf       | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | -0.02             |
| Kitchen ambient                  | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | -0.02             |
| Under kitchen sink               | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | -0.02             |
| Kitchen under counter            | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | -0.02             |
| Bathroom (ambient)               | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| Bathroom (toilet)                | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| Under bath location #1           | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| Under bath location #2           | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| Toilet waste pipe                | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| Under bathroom sink              | -              | -        | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| Upstairs landing (ambient)       | -              | -        | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1010                | 0.2               |
| First floor room LHS (ambient)   | -              | -        | 0     | 0        | 0            | 0.1   | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| First floor room LHS location #1 | -              | -        | 0     | 0        | 0            | 0.1   | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| First floor room LHS location #2 | -              | -        | 0     | 0        | 0            | 0.1   | 21.1 | 78.9    | 0      | 0       | 1010                | 0.2               |
| First floor room LHS location #3 | -              | -        | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1010                | 0.2               |
| First floor room RHS location #1 | -              | -        | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1010                | 0.2               |
| First floor room RHS location #2 | -              | -        | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1010                | 0.2               |
| First floor room RHS location #3 | -              | -        | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1010                | 0.2               |

Appendix M  
Table 2: Internal Survey Monitoring Results Event 2

| 17/06/2010                              |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Donal Gray - Gray's Joinery             |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                       | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                         | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                         |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                 | 15:27          | 15:28    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.77              | 0.6                          | -       | -       |
| Workshop/Office 1                       | 15:30          | 15:31    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.77              | 0.9                          | -       | -       |
| Back office/store (ambient)             | 15:30          | 15:31    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1020                | 0.77              | -                            | 0.7     | 0.8     |
| Back office/store (skirting)            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 1.6                          | -       | -       |
| Store (skirting)                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 1.4     | 1.5     |
| Toilet beside store                     | 15:29          | 15:30    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1021                | 0.77              | 0.8                          | -       | -       |
| Toilet sink joinings                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.9                          | -       | -       |
| Toilet waste pipe                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 1.9                          | -       | -       |
| Around skirting board in office 1       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Around indoor perimeter of workshop     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Workshop location 2 Ambient             | 15:28          | 15:29    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.77              | 0.7                          | -       | -       |
| Workshop location 3 Ambient             | 15:32          | 15:33    | 0     | 0        | 0            | 0     | 21.0 | 78.9    | 0      | 0       | 1021                | 0.77              | -                            | -       | -       |
| Workshop location 4 Ambient             | 15:33          | 15:34    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.77              | -                            | -       | -       |
| Paint room in workshop                  | 15:31          | 15:32    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.77              | -                            | -       | -       |
| Toolstore in workshop                   | 15:32          | 15:33    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.77              | 0.5                          | -       | -       |
| Crack in exterior wall                  | 15:40          | 15:41    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.77              | 0.1                          | -       | -       |
| Open shed                               | 15:34          | 15:35    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.5                          | -       | -       |
| Ambient reading outside Sligo glass     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Entrance (Sligo Glass)                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Sligo Glass Toilet (Customers) entrance | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Sligo Glass Toilet (Customers)          | 15:47          | 15:48    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.3                          | -       | -       |
| Sink joinings in toilet                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Toilet waste pipe                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| ESB box outside Sligo Glass             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Drain in car park                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Sligo Glass Office (ambient)            | 15:40          | 15:41    | 0     | 0        | 0            | 0-0.1 | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.4                          | -       | -       |
| Sligo Glass Office (skirting)           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Sligo Glass Showroom (ambient)          | 15:43          | 15:44    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.5                          | -       | -       |
| Sligo Glass Showroom (skirting)         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.5                          | -       | -       |
| Sligo Glass Workshop Location 1         | 15:45          | 15:46    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.5                          | -       | -       |
| Sligo Glass Workshop Location 2         | 15:46          | 15:47    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.5                          | -       | -       |
| Sligo Glass Workshop (skirting)         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.3     |
| Generator hut outside Gray's workshop   | 16:04          | 16:05    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.5                          | -       | -       |
| Under canteen building                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Canteen                                 | 15:57          | 15:58    | 0     | 0        | 0            | 0.1   | 20.9 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.2                          | -       | -       |
| Under sink in canteen                   | 15:58          | 15:59    | 0     | 0        | 0            | 0.1   | 20.9 | 78.9    | 0      | 0       | 1021                | 0.82              | -                            | -       | -       |
| Canteen (skirting)                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| Pipe at rear of green office portacabin | 16:00          | 16:01    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.2                          | -       | -       |
| Office 1 (reception in portacabin)      | 16:01          | 16:02    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.3                          | -       | -       |
| Toilet in portacabin                    | 16:02          | 16:03    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.4                          | -       | -       |
| Sink joinings in toilet (reception)     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Waste pipe in toilet (reception)        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Office 2 (portacabin) skirting          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| Office 2 (portacabin) ambient           | 16:03          | 16:04    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.82              | 0.5                          | -       | -       |

| 16/06/2010                          |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Peter Healy - Tamwell's diesel      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                   | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                     | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                     |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading             | 17:08          | 17:09    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Ambient indoor reading              | 17:09          | 17:10    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Around indoor perimeter of workshop | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 6.7     |
| Vehicle maintenance pit #1          | 17:10          | 17:11    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Mens toilet (Ambient reading)       | 17:11          | 17:12    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under sink in mens toilet           | 17:12          | 17:13    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Vehicle maintenance pit #2 ambient  | 17:13          | 17:14    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Vehicle maintenance pit #2 base     | 17:14          | 17:15    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Toolstore                           | 17:15          | 17:16    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Front store                         | 17:16          | 17:17    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Ladies toilet (Ambient)             | 17:17          | 17:18    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Ladies toilet at sink               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office (Ambient)                    | 17:18          | 17:19    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | -                            | -       | -       |
| Office (perimeter)                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 1.9     |
| Canteen                             | 17:19          | 17:20    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under IBC outside                   | 17:20          | 17:21    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under trailer/container             | 17:21          | 17:22    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under concrete chunk outside        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |

| Patrick Carty - Euroflow                       |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|------------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Location Surveyed                              | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                                | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                                |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                        | 17:58          | 17:59    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0.5                          | -       | -       |
| Tank 1                                         | 17:59          | 18:00    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Tank 2                                         | 18:00          | 18:01    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Tank 3                                         | 18:03          | 18:04    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under construction on stilts                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Portacabin # 1                                 | 18:02          | 18:03    | 0     | 0        | 0            | 0     | 21.2 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Portacabin #1 toilets                          | 18:03          | 18:04    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Toilet waste pipe                              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sink pipe                                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Canteen/kitchen                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under portacabin #2                            | 18:04          | 18:05    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under IBC (original location of portacabin #3) | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ambient                                        | 18:07          | 18:08    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1023                | 0.43              | -                            | -       | -       |

Note:  
- denotes no reading taken.

[illegible]

| 16/06/2010                                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Padraic McGowan - Taurus                   |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                          | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                            | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                            |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                    | 16:51          | 16:52    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.42              | 0                            | -       | -       |
| Shop ambient reading (front of shop)       | 16:52          | 16:53    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1020                | 0.43              | 0                            | -       | -       |
| Reading around skirting boards             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under shelves                              | 16:52          | 16:53    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Toilet (ambient)                           | 16:53          | 16:54    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Toilet at waste pipe                       | 16:54          | 16:55    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0.6                          | -       | -       |
| At back of sink                            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Shop second ambient reading (back of shop) | 16:56          | 16:57    | 0     | 0        | 0            | 0     | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -       | -       |
| Under stairs                               | 16:54          | 16:55    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.42              | 0                            | -       | -       |

**Note:**  
- denotes no reading taken.

Appendix M  
Table 2: Internal Survey Monitoring Results Event 2

| 17/06/2010                                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ann Casey - Shalomar                       |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                          | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                            | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                            |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                    | 11:41          | 11:42    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.3                          | -       | -       |
| Entrance hallway                           | 11:42          | 11:43    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.3                          | -       | -       |
| Around skirting board in entrance hallway  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.3     |
| TV Room/Lounge                             | 11:44          | 11:45    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.3                          | -       | -       |
| Around skirting board in TV room           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.4     |
| Bedroom with ensuite (Room 5)              | 11:45          | 11:46    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Around skirting board in bedroom           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.4     |
| Ensuite (ambient)                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Ensuite under sink                         | 11:46          | 11:47    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Ensuite at toilet waste pipe               | -              | -        | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.3                          | -       | -       |
| Hallway                                    | 12:00          | 12:01    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.3                          | -       | -       |
| Smoking room                               | 12:00          | 12:01    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Around skirting board in smoking room      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Store                                      | 11:47          | 11:48    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.6                          | -       | -       |
| Around skirting board in store             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.6     |
| Pantry (second store)                      | -              | -        | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.1                          | -       | -       |
| Store under stairs                         | 11:48          | 11:49    | 0     | 0        | 0            | 0.1   | 21.2 | 78.2    | 0      | 0       | 1022                | 0.81              | -                            | 0.1     | 0.2     |
| Room 3 (ambient)                           | 12:02          | 12:03    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.1                          | -       | -       |
| Room 3 (skirting)                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Dining area of kitchen                     | 11:56          | 11:57    | 0     | 0        | 0            | 0     | 21.2 | 78.7    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |
| Around skirting board in dining area       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Cooking area of kitchen                    | 11:49          | 11:50    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Around skirting board in cooking area      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under sink 1 in cooking area               | 11:50          | 11:51    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |
| Under sink 2 in cooking area (double sink) | 11:50          | 11:51    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |
| Back kitchen                               | 11:53          | 11:54    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Under sink in back kitchen                 | 11:55          | 11:56    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |
| Gents toilet                               | 11:58          | 11:59    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Gents toilet at sink                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Gents toilet at wastepipe                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Disabled toilet (ambient)                  | 11:56          | 11:57    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.1                          | -       | -       |
| At pipes under sink                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Toilet at waste pipe                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Shower room (ambient)                      | 11:57          | 11:58    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |
| Sink in shower room                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Reception (ambient)                        | 11:43          | 11:44    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |
| Activities/games room                      | 12:04          | 12:05    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.1                          | -       | -       |
| Around skirting board in activites room    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Laundry room off activities room           | 12:03          | 12:04    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0.2                          | -       | -       |
| Laundry room (skirting)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| External store                             | 12:05          | 12:06    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.81              | 0                            | -       | -       |

| 17/06/2010                                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ronnie Dunne - Calor Gas                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                   | 09:43          | 09:44    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1022                | 0.41              | 0.6                          | -       | -       |
| Reception office (ambient)                | 09:44          | 09:45    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1022                | 0.41              | 0.6                          | -       | -       |
| Around skirting board in reception office | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.6                          | -       | -       |
| Toilet                                    | 09:47          | 09:48    | 0     | 0        | 0            | 0.1   | 20.9 | 79.9    | 0      | 0       | 1022                | 0.51              | 0.7                          | -       | -       |
| Toilet at waste pipe                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 1                            | -       | -       |
| At pipes under sink                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.8                          | -       | -       |
| Canteen/kitchen                           | 09:45          | 09:46    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1022                | 0.41              | 0.6                          | -       | -       |
| Canteen under sink                        | 09:46          | 09:47    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1022                | 0.41              | 1.1                          | -       | -       |
| In shower in bathroom                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.6                          | -       | -       |
| Under pump house door (no access)         | 09:47          | 09:48    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1022                | 0.51              | 0.4                          | -       | -       |
| Under blue container                      | 09:48          | 09:49    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1022                | 0.51              | 0.5                          | -       | -       |
| Brown side tin shed                       | 09:49          | 09:50    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1022                | 0.51              | 0.4                          | -       | -       |
| Gantry/large pump house                   | 09:50          | 09:51    | 0     | 0        | 0            | 0/0.1 | 21.1 | 78.9    | 0      | 0       | 1022                | 0.51              | 0.9                          | -       | -       |
| Telephone box                             | 09:51          | 09:52    | 0     | 0        | 0            | 0     | 21.0 | 78.9    | 0      | 0       | 1022                | 0.51              | 0.2                          | -       | -       |

| 17/06/2010                        |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ms. Jeanne Dolan                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                 | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                   | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                   |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Entrance to cul de sac (ambient)  | 10:44          | 10:45    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1022                | 0.62              | 0.5                          | -       | -       |
| Entrance hallway                  | 10:45          | 10:46    | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.4                          | -       | -       |
| Entrance hallway skirting         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| Front room #1                     | 10:51          | 10:52    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.3                          | -       | -       |
| Front room #2                     | 10:52          | 10:53    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.3                          | -       | -       |
| Front room skirting               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Under stairs #1                   | 10:53          | 10:54    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| Under stairs #2                   | 10:54          | 10:55    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| Under stairs with FID             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Hall                              | 10:55          | 10:56    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.4                          | -       | -       |
| Skirting in hall                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Small back room with shelf        | 10:56          | 10:57    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.4                          | -       | -       |
| Small back room skirting          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Kitchen ambient                   | 10:57          | 10:58    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.2                          | -       | -       |
| Under kitchen sink                | 11:03          | 11:04    | 0     | 0        | 0            | 0.1   | 21.1 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.1                          | -       | -       |
| Kitchen under counter             | 11:04          | 11:05    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.2                          | -       | -       |
| Kitchen skirting                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Bathroom (ambient)                | 10:57          | 10:58    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.62              | 0.4                          | -       | -       |
| Bathroom (skirting)               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| Bathroom (toilet)                 | 10:58          | 10:59    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.3                          | -       | -       |
| Under bath location #1            | 11:00          | 11:01    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| Under bath location #2            | 11:01          | 11:02    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| All along underneath of bath      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.4     |
| Toilet waste pipe                 | 11:02          | 11:03    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.3                          | -       | -       |
| Under bathroom sink               | 11:02          | 11:03    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.3                          | -       | -       |
| Upstairs landing (ambient)        | 11:06          | 11:07    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.62              | 0.1                          | -       | -       |
| Upstairs landing (skirting)       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.1     |
| First floor room LHS (ambient)    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| First floor room LHS (skirting)   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.3     |
| First floor room RHS (ambient)    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| First floor room RHS (skirting)   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| First floor room LHS location #1  | 11:07          | 11:08    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| First floor room LHS location #2  | 11:08          | 11:09    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| First floor room LHS location #3  | 11:09          | 11:10    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| First floor room RHS location #1  | 11:10          | 11:11    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| First floor room RHS location #2  | 11:11          | 11:12    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| First floor room RHS location #3  | 11:12          | 11:13    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1022                | 0.62              | -                            | -       | -       |
| Downstairs back room (bedroom) #1 | 11:04          | 11:05    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.2                          | -       | -       |
| Downstairs back room (bedroom) #2 | 11:05          | 11:06    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.62              | 0.2                          | -       | -       |
| Downstairs back room (skirting)   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |

Appendix M  
Table 2: Internal Survey Monitoring Results Event 2

| 18/06/2010                                      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Declan Caslin - Hunter's Coals                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                               | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                                 | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                                 |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient reading external to site                | 08:50          | 08:51    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Crack (1) outside of shed (A)                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Corner of front building (location 1) (ambient) | 08:51          | 08:52    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | -                            | -       | -       |
| At door handle of shed (A) with no access       | 08:52          | 08:53    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Under green container                           | 08:54          | 08:55    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Under red container                             | 08:53          | 08:54    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Scales/weighing room                            | 08:55          | 08:56    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Foot of gantry                                  | 09:00          | 09:01    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Ambient reading (location 3)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Packing plant (shed B) Ambient                  | 09:40          | 09:41    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Packing plant (shed B) around perimeter         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Packing plant (shed B) under shelves            | 09:41          | 09:42    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Tool shed in shed B                             | 09:42          | 09:43    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Canteen                                         | 09:11          | 09:12    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Canteen skirting                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| In cupboard under sink                          | 09:12          | 09:13    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Office block reception entrance                 | 09:45          | 09:46    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0.3                          | -       | -       |
| Office block reception entrance skirting        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.3     |
| Office 1                                        | 09:46          | 09:47    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Office 1 skirting board                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office 1 cupboard                               | 09:47          | 09:48    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Office 2 ambient                                | 09:49          | 09:50    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Office 2 skirting board                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office 3 ambient                                | 09:50          | 09:51    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Office 3 skirting board                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception office ambient (near desk)            | 09:51          | 09:52    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Reception office skirting                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Office block kitchen                            | 09:56          | 09:57    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0.2                          | -       | -       |
| Office block kitchen skirting                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.1     |
| Office block kitchen (under sink)               | 09:57          | 09:58    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0.2                          | -       | -       |
| Office block Mens toilet ambient                | 09:58          | 09:59    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.45              | -                            | 0.3     | 0.8     |
| Office block Mens toilet at waste pipe          | 09:59          | 10:00    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.45              | 0.7                          | -       | -       |
| Office block Ladies toilet (Ambient)            | 10:01          | 10:02    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.45              | 0.2                          | -       | -       |
| Office block Ladies toilet at waste pipe        | 10:02          | 10:03    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.45              | 0.2                          | -       | -       |
| Ladies toilet around pipes and skirting board   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Office block hallway                            | 09:48          | 09:49    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Declan Caslin's office (general manager)        | 10:00          | 10:01    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.45              | 0.1                          | -       | -       |
| General managers office skirting                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Drain 8                                         | 10:03          | 10:04    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1020                | 0.45              | 0.1                          | -       | -       |
| Locker area                                     | 09:11          | 09:12    | 0     | 0        | 0            | 0.1   | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Toilet in locker area                           | 09:12          | 09:13    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Gents toilet beside locker area                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Crack in weighbridge                            | 09:43          | 09:44    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Rusty pipe                                      | 09:04          | 09:05    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Ambient C (at rear of facility)                 | -              | -        | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Drain 1                                         | 09:02          | 09:03    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 30                           | 6       | 100     |
| Drain 2                                         | 09:04          | 09:05    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Drain 3                                         | 08:55          | 08:56    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Drain 4                                         | 08:57          | 08:58    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Drain 5                                         | 08:59          | 09:00    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Drain 6                                         | 09:01          | 09:02    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Drain 7                                         | 09:05          | 09:06    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 1.2                          | -       | -       |
| Manhole 3 (by kitchen)                          | 09:10          | 09:11    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Kitchen drain (Drain 12)                        | 09:09          | 09:10    | 0     | 0        | 0            | 0.1   | 21.6 | 78.3    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |
| Office drain (Drain 11)                         | 09:13          | 09:14    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Drain 13 (downpipe behind toilets)              | 09:08          | 09:09    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1020                | 0.29              | 0                            | -       | -       |

| 17/06/2010                                    |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Sinead O'Hara - Erin Recyclers                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                             | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                               | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                               |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                       | 13:49          | 13:50    | 0     | 0        | 0            | 0     | 20.9 | 79.2    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Reception                                     | 13:50          | 13:51    | 0     | 0        | 0            | 0.1   | 20.8 | 79.2    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Reception hall (ambient)                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Entrance to reception (skirting)              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception (office 1) #2                       | 13:51          | 13:52    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Reception #2 around skirting board            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Conference room (ambient)                     | 13:20          | 13:21    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0.1                          | -       | -       |
| Conference room (skirting)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Store (ambient)                               | 13:14          | 13:15    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Hall (ambient)                                | 13:13          | 13:14    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Hall skirting board                           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ladies toilets                                | 11:16          | 11:17    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0.1                          | -       | -       |
| Toilet at waste pipe                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Sink at pipes                                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Back office                                   | 13:15          | 13:16    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Gents toilets                                 | 13:17          | 13:18    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Toilet at waste pipe                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Toilet at sink pipe                           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Kitchen (ambient)                             | 13:18          | 13:19    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0.1                          | -       | -       |
| Kitchen (under sink)                          | 13:19          | 13:20    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.46              | 0.2                          | -       | -       |
| Around skirting board in kitchen              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Office at front (office 2) (ambient)          | 13:12          | 13:13    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Office at front skirting board                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Trench at back of office with yellow pipe     | 14:37          | 14:38    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.84              | -                            | -       | -       |
| Under green recycling unit location 1         | 14:38          | 14:39    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.84              | 0.2                          | -       | -       |
| Under green recycling unit location 2         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Large grid in yard                            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 7 (beside office)                        | 14:28          | 14:29    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Pipe 8 (beside office)                        | 14:29          | 14:30    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Pipe 9 (cable in it, beside office)           | 14:30          | 14:33    | 0     | 0        | 0            | 1.8   | 17.3 | 80.9    | 0      | 0       | 1021                | 0.46              | 3                            | -       | -       |
| Pipe 10 (red, behind office)                  | 14:33          | 14:34    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.46              | 0.3                          | -       | -       |
| Pipe 11 (orange, back of office)              | 14:34          | 14:36    | 0.9   | 17       | 0.9          | 8.4   | 4.0  | 86.7    | 0      | 0       | 1021                | 0.84              | 300                          | -       | 1100    |
| Pipe 12 (yellow in trench)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Drain 5 (at entrance)                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 3.4                          | -       | -       |
| Pipe 1 (behind front shed)                    | 15:05          | 15:06    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.84              | 0.2                          | -       | -       |
| Pipe 2 (behind front shed)                    | 15:06          | 15:07    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.84              | 0.3                          | -       | -       |
| Pipe 3 (at foot of stairs in shed, no cables) | 14:17          | 14:18    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1021                | 0.46              | -                            | 47      | 63      |
| Pipe 4 (at foot of stairs, cables in it)      | 14:16          | 14:17    | 0     | 0        | 0            | 1     | 17.9 | 81.0    | 0      | 0       | 1021                | 0.46              | -                            | 67      | 105     |
| Front shed (ambient)                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Front shed location 1                         | 13:12          | 13:13    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1021                | 0.46              | -                            | -       | -       |
| Front shed location 2                         | 14:18          | 14:19    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | -                            | -       | -       |
| Front shed location 3                         | 14:19          | 14:20    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | -                            | -       | -       |
| Around inside perimeter of front shed         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.7     |
| Maintenance pit                               | 14:20          | 14:21    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | -                            | -       | -       |
| Maintenance pit at base                       | 14:21          | 14:22    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | -                            | 1.4     | 2.7     |
| Pipe 5 (side of pit under steps)              | 14:22          | 14:23    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | 0.3                          | -       | -       |
| Pipe 6 at outside (beside pit, cable in it)   | 14:23          | 14:24    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | -                            | -       | -       |
| Pipe 6 at inside                              | 14:24          | 14:25    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1021                | 0.46              | -                            | -       | -       |
| Workshop/toolshed                             | 14:21          | 14:22    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.46              | 0.7                          | -       | -       |
| Around inside perimeter of tool shed          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.5     |
| Central crack in base of tool shed            | 14:26          | 14:27    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.46              | 0.3                          | -       | -       |
| Under base of tool shed green side (front)    | 14:27          | 14:28    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1021                | 0.46              | 6.1                          | -       | -       |
| Back garage/ smaller shed                     | 14:35          | 14:36    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.46              | 0                            | -       | -       |
| Back garage wall (originally trench)          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Crack in floor of garage                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |

Appendix M  
Table 2: Internal Survey Monitoring Results Event 2

| Darragh Quinn - Sligo Fuels               |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |             |             |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|-------------|-------------|
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |             |             |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |             |             |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stationary reading           | Minimum CH4 | Maximum CH4 |
| Ambient outdoor reading                   | 17:31          | 17:32    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 1.9                          | -           | -           |
| Drain 1 (by diesel pumps)                 | 17:32          | 17:33    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | -                            | 1.8         | 15          |
| Under blue truck                          | 17:35          | 17:36    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| Crack in ground                           | 17:40          | 17:41    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| Under red storage container               | 17:36          | 17:37    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| In red storage container                  | 17:36          | 17:37    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| Around inside perimeter of red container  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Under blue storage container              | 17:33          | 17:34    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 1                            | -           | -           |
| Around inside perimeter of blue container | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 1.7         | 2.2         |
| In blue storage container                 | 17:34          | 17:35    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 1.6                          | -           | -           |
| Toilet (Portaloo)                         | 17:34          | 17:35    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.43              | 0.4                          | -           | -           |
| Reception (ambient)                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Main office                               | 17:41          | 17:42    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| Around skirting board of main office      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Second office                             | 17:42          | 17:43    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| Kitchen (ambient)                         | 17:44          | 17:45    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |
| Around skirting board in kitchen          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -           | -           |
| Kitchen (under sink)                      | 17:45          | 17:46    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1022                | 0.43              | 0                            | -           | -           |

| 17/06/2010                               |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Aiden McGloin - Celtic Anglian Water Ltd |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                        | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                          | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                          |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                  | 09:20          | 09:21    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0                            | -       | -       |
| Entrance hallway                         | 09:21          | 09:22    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0.2                          | -       | -       |
| Women's toilet (Ambient)                 | 09:22          | 09:23    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0.3                          | -       | -       |
| Women's toilet at sink pipe              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Women's toilet at waste pipe             | 09:23          | 09:24    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0.3                          | -       | -       |
| Around toilet at skirting board          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Gents toilets ambient                    | 09:30          | 09:31    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.26              | 0.8                          | -       | -       |
| Gents toilets at toilet waste pipe       | 09:29          | 09:30    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.26              | 0.7                          | -       | -       |
| Main hallway                             | 09:24          | 09:25    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0.3                          | -       | -       |
| Around skirting board in hall            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Lab                                      | 09:25          | 09:26    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0.4                          | -       | -       |
| Around skirting board in lab             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| By fridge and sink (crack)               | 09:26          | 09:27    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1021                | 0.26              | 0.4                          | -       | -       |
| Canteen (Ambient)                        | 09:27          | 09:28    | 0     | 0        | 0            | 0.1   | 21.2 | 78.1    | 0      | 0       | 1021                | 0.26              | 0.4                          | -       | -       |
| Canteen (under sink)                     | 09:28          | 09:29    | 0     | 0        | 0            | 0.1   | 21.2 | 78.1    | 0      | 0       | 1022                | 0.41              | 0.2                          | -       | -       |
| Around skirting board in canteen         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.4     |
| Storage                                  | 09:30          | 09:31    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.41              | 0.6                          | -       | -       |
| Storage cupboard (Health and Safety)     | 09:31          | 09:32    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.41              | 0.5                          | -       | -       |
| Office 1 (ambient)                       | 09:32          | 09:33    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.41              | 0.5                          | -       | -       |
| Office 1 around skirting board           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.4     | 0.5     |
| Office 2 ambient                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.6                          | -       | -       |
| Office 2 at skirting board               | 09:33          | 09:34    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1022                | 0.41              | 0.5                          | -       | -       |
| Ambient outdoor                          | 10:11          | 10:12    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1022                | 0.41              | 0                            | -       | -       |
| Locker room (ambient)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Generator                                | 10:15          | 10:16    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1022                | 0.57              | 0.3                          | -       | -       |
| Perimeter of generator room              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| Screening room                           | 09:29          | 09:30    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.57              | 1.1                          | -       | -       |
| Screening room skirting board            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.9     | 1.4     |
| Workshop                                 | 10:18          | 10:19    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1022                | 0.57              | 0.4                          | -       | -       |
| Perimeter of workshop                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| Drain by odour control                   | 10:22          | 10:23    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1022                | 0.57              | 0.6                          | -       | -       |
| Sludge dewatering buffer                 | 10:23          | 10:24    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.57              | 0.3                          | -       | -       |
| Perimeter of sludge dewatering buffer    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.5     |
| Grate in sludge dewatering buffer        | 10:24          | 10:25    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.57              | 0                            | -       | -       |
| UV plant control                         | 10:26          | 10:27    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1022                | 0.57              | 0                            | -       | -       |
| Cable duct                               | 10:27          | 10:28    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1022                | 0.57              | 0.2                          | -       | -       |

Note:  
- denotes no reading taken.



Appendix M  
Table 2: Internal Survey Monitoring Results Event 2

| 18/06/10/2010                              |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Paul McGoldrick - Cold Chon                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                          | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                            | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                            |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                    | 10:50          | 10:51    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Bungalow reception ambient                 | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Bungalow kitchen (ambient)                 | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Around skirting board in kitchen           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Bungalow kitchen (under sink)              | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Bungalow toilet ambient                    | -              | -        | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1021                | 0.63              | 0.2                          | -       | -       |
| Bungalow toilet under sink                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Bungalow toilet at waste pipe              | -              | -        | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1021                | 0.63              | 0.1                          | -       | -       |
| Bungalow computer network room             | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Bungalow main office                       | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.63              | 0.1                          | -       | -       |
| Bungalow main office skirting              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Maintenance shed (open shed)               | 10:51          | 10:52    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Vehicle maintenance pit                    | 10:52          | 10:53    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Shed/store (compressor room)               | 10:53          | 10:54    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Diesel tank                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Grid 1 (beside diesel tank)                | 10:49          | 10:50    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Production plant                           | 10:47          | 10:48    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Production plant skirting                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Production plant control room              | 10:48          | 10:49    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Lab (ambient)                              | 10:43          | 10:44    | 0     | 0        | 0            | 0     | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0.4                          | -       | -       |
| Lab skirting                               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.4     | 0.6     |
| Lab (under sink)                           | 10:44          | 10:45    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | -                            | -       | -       |
| Lab store                                  | 10:45          | 10:46    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | -                            | 0.6     | 1.1     |
| Cupboard in lab                            | 10:46          | 10:47    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1020                | 0.45              | 0.9                          | -       | -       |
| Reception to sales/dispatch office         | 10:20          | 10:21    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.45              | 0.1                          | -       | -       |
| Sales/dispatch office                      | 10:21          | 10:22    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.45              | 0.1                          | -       | -       |
| Sales/dispatch office skirting board       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Sales/dispatch store                       | 10:21          | 10:22    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1020                | 0.45              | 0.1                          | -       | -       |
| Store skirting board                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Locker in store                            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Production office (Portacabin) ambient     | 10:23          | 10:24    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Production office skirting board           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under production office                    | 10:23          | 10:24    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Toilets (beside production office) ambient | 10:25          | 10:26    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Toilets (beside production office) at rear | 10:27          | 10:28    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Drain 7 (toilets beside production office) | 10:26          | 10:27    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Locker room                                | 10:28          | 10:29    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Locker room skirting board                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Canteen                                    | 10:29          | 10:30    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Canteen skirting board                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under canteen sink                         | 10:30          | 10:31    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Drain 5                                    | 10:31          | 10:32    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1020                | 0.45              | 0.6                          | -       | -       |
| Drain 4                                    | 10:32          | 10:33    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Small store (oil spill)                    | 10:33          | 10:34    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1020                | 0.45              | 2.8                          | -       | -       |
| Paint store                                | 10:34          | 10:35    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Workshop                                   | 10:35          | 10:36    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Workshop skirting                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toolstore                                  | 10:36          | 10:37    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Boiler room ambient                        | 10:47          | 10:48    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Boiler room skirting                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 1 (boiler room entrance)              | 10:48          | 10:49    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1020                | 0.45              | 0                            | -       | -       |
| Weighbridge                                | -              | -        | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Drain 3                                    | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.7    | 0      | 0       | 1021                | 0.63              | 0.1                          | -       | -       |
| Interceptor                                | 10:54          | 10:55    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1021                | 0.63              | 3                            | -       | -       |
| Drain 13 (red brick)                       | 10:55          | 10:56    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Drain 1                                    | 10:56          | 10:57    | 0     | 0        | 0            | 0     | 21.5 | 78.6    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Drain 2                                    | 10:57          | 10:58    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Manhole A                                  | 10:58          | 10:59    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1021                | 0.63              | 0                            | -       | -       |
| Manhole B                                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 2                            | -       | -       |

| 17/06/2010                                    |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Barry Gallagher - Greenstar                   |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                             | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                               | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                               |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                       | 16:37          | 16:38    | 0     | 0        | 0            | 0     | 20.8 | 79.2    | 0      | 0       | 1021                | 0.96              | 0.4                          | -       | -       |
| Reception hall (Ambient)                      | 16:38          | 16:39    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1021                | 0.96              | 0.1                          | -       | -       |
| Reception hall around skirting board          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Reception office                              | 16:44          | 16:45    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.96              | -                            | -       | -       |
| Front office beside reception                 | 16:45          | 16:46    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.96              | 0.2                          | -       | -       |
| Main office (front large office)              | 16:44          | 16:45    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1021                | 0.96              | 0.3                          | -       | -       |
| ESB Room                                      | 16:43          | 16:44    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.96              | 0.2                          | -       | -       |
| Canteen (Ambient)                             | 16:39          | 16:40    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1021                | 0.96              | 0.3                          | -       | -       |
| Canteen around skirting boards                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.3     |
| Canteen cupboard under sink                   | 16:40          | 16:41    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1021                | 0.96              | 0.2                          | -       | -       |
| Toilets (Ambient)                             | 16:41          | 16:42    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1021                | 0.96              | 0.3                          | -       | -       |
| Toilets at waste pipe                         | 16:42          | 16:43    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.96              | 0.3                          | -       | -       |
| Changing room                                 | 16:43          | 16:44    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1021                | 0.96              | 0.2                          | -       | -       |
| Around changing/locker room skirting board    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.2     |
| Waste depot (shed 1)                          | 17:02          | 17:03    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1021                | 0.88              | 0.1                          | -       | -       |
| Waste quarantine (waste depot)                | 17:01          | 17:02    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1021                | 0.88              | -                            | -       | -       |
| Small generator room (waste depot)            | 17:02          | 17:03    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1021                | 0.88              | -                            | -       | -       |
| Under raised slab                             | 17:05          | 17:06    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Under door of fishmeal store (no access)      | 16:48          | 16:49    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.96              | 0.2                          | -       | -       |
| Toilets in little shed                        | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.83              | 0                            | -       | -       |
| Drain A                                       | 17:11          | 17:12    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1021                | 0.88              | 0.2                          | -       | -       |
| Drain B                                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Drain C                                       | 17:11          | 17:12    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Drain D                                       | 16:36          | 16:37    | 0     | 0        | 0            | 0     | 20.8 | 79.2    | 0      | 0       | 1021                | 0.96              | 0                            | -       | -       |
| Drain E                                       | 16:58          | 16:59    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Drain F                                       | 16:59          | 17:00    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.88              | 0.3                          | -       | -       |
| Drain G                                       | 17:10          | 17:11    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1021                | 0.88              | 3.6                          | -       | -       |
| Drain H (by entrance)                         | 17:09          | 17:10    | 0     | 0        | 0            | 0.1   | 21.4 | 78.6    | 0      | 0       | 1021                | 0.88              | 1.7                          | -       | -       |
| Drain I                                       | 17:07          | 17:08    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Drain J                                       | -              | -        | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.83              | 0                            | -       | -       |
| Drain 7                                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 1 (back of office)                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Pipe 9 (by fishmeal store)                    | 16:35          | 16:36    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1021                | 0.96              | 0                            | -       | -       |
| Pipe 10 (by fishmeal store)                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 11 (by fishmeal store)                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 12 (beside waste depot)                  | 17:03          | 17:04    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Pipe 13 (high pipe)                           | 17:16          | 17:17    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.83              | 0                            | -       | -       |
| Pipe 6                                        | 17:06          | 17:07    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Manhole 6 (lid off)                           | 17:15          | 17:16    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1021                | 0.86              | 0                            | -       | -       |
| Pipe 2 (side of little shed)                  | 17:12          | 17:13    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Groundwater monitoring well (MW2)             | 17:08          | 17:09    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |
| Interceptor 1                                 | -              | -        | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1021                | 0.83              | 0                            | -       | -       |
| Under container (green) beside fishmeal store | 16:49          | 16:50    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1021                | 0.88              | 0                            | -       | -       |

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 22/06/2010                                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|---------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Donal Gray - Gray's Joinery                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                           | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                             | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                             |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                     | 15:40          | 15:41    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.61              | 0.6                          | -       | -       |
| Workshop/Office 1                           | 15:43          | 15:44    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.6                          | -       | -       |
| Back office/store (ambient)                 | 15:46          | 15:47    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.5                          | -       | -       |
| Back office/store (skirting)                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.5     |
| Toilet beside store                         | 15:47          | 15:48    | 0     | 0        | 0            | 0     | 21.1 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Toilet sink joinings                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.5                          | -       | -       |
| Toilet waste pipe                           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.5                          | -       | -       |
| Around indoor perimeter of workshop         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.4     |
| Workshop location 2 Ambient                 | 15:45          | 15:46    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Workshop location 3 Ambient                 | 15:52          | 15:53    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | -                            | -       | -       |
| Workshop location 4 Ambient                 | 15:53          | 15:54    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | -                            | -       | -       |
| Paint room in workshop                      | 15:50          | 15:51    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.1                          | -       | -       |
| Toolstore in workshop                       | 15:51          | 15:52    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Crack in exterior wall                      | 16:11          | 16:12    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Open shed                                   | 15:56          | 15:57    | 0     | 0        | 0            | 0     | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.3                          | -       | -       |
| Ambient reading outside Sligo glass         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Entrance (Sligo Glass)                      | 15:57          | 15:58    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -       | -       |
| Sligo Glass Toilet (Customers) entrance     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Sligo Glass Toilet (Customers)              | 15:59          | 16:00    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -       | -       |
| Sink joinings in toilet                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Toilet waste pipe                           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| ESB box outside Sligo Glass                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Drain in car park                           | 16:09          | 16:10    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Sligo Glass Office (ambient)                | 16:06          | 16:07    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Sligo Glass Office (skirting)               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.3     |
| Sligo Glass Showroom (ambient)              | 16:00          | 16:01    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.3                          | -       | -       |
| Sligo Glass Showroom (skirting)             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| Sligo Glass Workshop Location 1             | 16:03          | 16:04    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.3                          | -       | -       |
| Sligo Glass Workshop (skirting)             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| Generator hut outside Gray's workshop       | 15:41          | 15:42    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.61              | 0.7                          | -       | -       |
| Under canteen building                      | 16:18          | 16:19    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Canteen                                     | 16:12          | 16:13    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.1                          | -       | -       |
| Under sink in canteen                       | 16:14          | 16:15    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.1                          | -       | -       |
| Canteen (skirting)                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Pipe at rear of green office portacabin     | 16:19          | 16:20    | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Toilet pipe at rear of office portacabin    | 16:27          | 16:28    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Office 1 (reception in portacabin)          | 16:20          | 16:21    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.1                          | -       | -       |
| Office 1 (reception in portacabin) skirting | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Toilet in portacabin                        | 16:23          | 16:24    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Sink joinings in toilet (reception)         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Waste pipe in toilet (reception)            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Office 2 (portacabin) skirting              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| Office 2 (portacabin) ambient               | 16:22          | 16:23    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |

| 22/06/2010 - 23/06/10               |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Peter Healy - Tamwell's diesel      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                   | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                     | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                     |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading             | 15:10          | 15:11    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.6                          | -       | -       |
| Ambient indoor reading              | 15:11          | 15:12    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.6                          | -       | -       |
| Around indoor perimeter of workshop | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 1       |
| Vehicle maintenance pit #1          | 15:12          | 15:13    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Mens toilet (Ambient reading)       | 15:18          | 15:19    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Under sink in mens toilet           | 15:19          | 15:20    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Vehicle maintenance pit #2 ambient  | 15:14          | 15:15    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Toolstore                           | 15:15          | 15:16    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Front store                         | 15:17          | 15:18    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 1.3                          | -       | -       |
| Ladies toilet (Ambient)             | 15:22          | 15:23    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.4                          | -       | -       |
| Ladies toilet at sink               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.6                          | -       | -       |
| Ladies toilet at waste pipe         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Office (Ambient)                    | 15:21          | 15:22    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.5                          | -       | -       |
| Office (perimeter)                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.5     |
| Canteen                             | 15:23          | 15:24    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.6                          | -       | -       |
| Under IBC outside                   | 15:25          | 15:26    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Under trailer/container             | 15:27          | 15:28    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -       | -       |
| Large drain                         | 15:26          | 15:27    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |
| Drain 1                             | 17:18          | 17:19    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 2                             | 17:19          | 17:20    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 3                             | 17:20          | 17:21    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Under oil tank                      | 17:21          | 17:22    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Under concrete chunk outside        | 15:29          | 15:30    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |

| 22/06/2010                                     |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|------------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Patrick Carty - Euroflow                       |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                              | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                                | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                                |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                        | 17:16          | 17:17    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Tank 1                                         | 17:11          | 17:12    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Tank 2                                         | 17:13          | 17:14    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Tank 3                                         | 17:15          | 17:16    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Under construction on stilts                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Portacabin # 1                                 | 17:20          | 17:21    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Portacabin #1 toilets                          | 17:22          | 17:23    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Toilet waste pipe                              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sink pipe                                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Canteen/kitchen                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under portacabin #2                            | 17:25          | 17:26    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Under IBC (original location of portacabin #3) | 17:28          | 17:29    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |
| Ambient                                        | 17:27          | 17:28    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0                            | -       | -       |

Note:  
- denotes no reading taken.

| 17/06/2010                                    |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Finbarr Sweeny - Maryville                    |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                             | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                               | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                               |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                       | 12:20          | 12:21    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Front office (ambient)                        | 12:23          | 12:24    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Entrance hallway                              | 12:21          | 12:22    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Main hallway                                  | 12:22          | 12:23    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Main hallway (skirting)                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Kitchen 1 (ambient)                           | 12:29          | 12:30    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| Kitchen 1 (cupboard under sink LHS)           | 12:30          | 12:31    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.1               | 0.1                          | -       | -       |
| Kitchen 1 (cupboard under sink RHS)           | 12:32          | 12:33    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Kitchen 1 around skirting boards              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sitting room/TV area beside kitchen 1         | 12:24          | 12:25    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Sitting room beside kitchen 1 (skirting)      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Back garden ambient                           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Garden shed (under door)                      | 12:38          | 12:39    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| Downstairs bathroom ambient                   | 12:27          | 12:28    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| Downstairs toilet at waste pipe               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Shower in downstairs bathroom                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Downstairs bathroom sink at pipes             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Hallway between kitchen 1 and 2               | 12:42          | 12:43    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| Kitchen 2 (ambient)                           | 12:44          | 12:45    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.71              | 0.1                          | -       | -       |
| Kitchen 2 around skirting board               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Cupboard under sink in kitchen 2              | 12:45          | 12:46    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| Kitchen 3 (ambient)                           | 12:49          | 12:50    | 0     | 0        | 0            | 0.1   | 21.4 | 78.6    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Kitchen 3 around skirting board               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Cupboard under sink in kitchen 3              | 12:50          | 12:51    | 0     | 0        | 0            | 0.1   | 21.4 | 78.6    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| 1st side Hallway between kitchen 2 and 3      | 12:46          | 12:47    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0.1                          | -       | -       |
| 2nd side hallway between kitchen 2 and 3      | 12:48          | 12:49    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Main hallway between kitchen 2 and 3          | 12:47          | 12:48    | 0     | 0        | 0            | 0.1   | 21.4 | 78.6    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| Cupboard under stairs                         | 12:57          | 12:58    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Sitting room                                  | 12:25          | 12:26    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.1                          | -       | -       |
| Sitting room around skirting boards           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Sitting room cupboard                         | 12:26          | 12:27    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Upstairs landing                              | 12:51          | 12:52    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0.1                          | -       | -       |
| Upstairs shower only                          | 12:52          | 12:53    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0.2                          | -       | -       |
| In shower                                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sink pipes in upstairs shower room            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Upstairs toilets                              | 12:53          | 12:54    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Upstairs toilets under waste pipe             | 12:54          | 12:55    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0.1                          | -       | -       |
| Sinks in upstairs toilet room                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Drain 1 (outside kitchen #1)                  | 12:33          | 12:34    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Drain 2 (outside kitchen #1)                  | 12:34          | 12:35    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Drain 3 (outside kitchen #1)                  | 12:35          | 12:36    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 4 (outside kitchen #1)                  | 12:36          | 12:37    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 5 (outside kitchen #1)                  | 12:37          | 12:38    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 6 (outside kitchen #3 at side of house) | 12:40          | 12:41    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 7 (outside kitchen #3 at side of house) | 12:41          | 12:42    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.71              | 0.7                          | -       | -       |
| Drain 8 (side of house)                       | 13:00          | 13:01    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 9 (side of house)                       | 13:01          | 13:02    | 0     | 0        | 0            | 0.3   | 21.0 | 78.7    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 10 (front of house)                     | 13:02          | 13:03    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 11 (front of house)                     | 13:03          | 13:04    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 12 (front of house)                     | 13:04          | 13:05    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 13 (front of house)                     | 13:05          | 13:06    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 14 (front of house)                     | 13:06          | 13:07    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 15 (front of house)                     | 13:07          | 13:08    | 0     | 0        | 0            | 0.1   | 21.4 | 78.8    | 0      | 0       | 1013                | 0.71              | 0                            | -       | -       |
| Drain 16 (front of house)                     | 13:08          | 13:09    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.73              | 0                            | -       | -       |
| Drain 17 (front of house)                     | 13:12          | 13:13    | 0     | 0        | 0            | 0.2   | 21.3 | 78.5    | 0      | 0       | 1013                | 0.74              | 0                            | -       | -       |
| Drain 18 (front of house)                     | 13:13          | 13:14    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1013                | 0.75              | 0                            | -       | -       |

[illegible]

| 22/06/2010                          |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Michael Murrick - Senator Windows   |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                   | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                     | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                     |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading             | 14:27          | 14:28    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.7                          | -       | -       |
| Gravel strip outside front door     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.5                          | -       | -       |
| Ambient indoor reading              | 14:28          | 14:29    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.34              | 0.7                          | -       | -       |
| Ambient reading in toilet           | 14:29          | 14:30    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.7                          | -       | -       |
| Waste pipe at back of toilet        | 14:30          | 14:31    | 0     | 0        | 0            | 0.1   | 21.0 | 78.8    | 0      | 0       | 1015                | 0.34              | 0.8                          | -       | -       |
| Pipe at back of sink                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.8                          | -       | -       |
| Store (location A)                  | 14:31          | 14:31    | 0     | 0        | 0            | 0.1   | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.7                          | -       | -       |
| Store (location B)                  | 14:33          | 14:34    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.7                          | -       | -       |
| Store (skirting)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.6     | 0.9     |
| Canteen space (under sink in store) | 12:31          | 12:32    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.34              | 1.2                          | -       | -       |
| At rear (outside by manhole)        | 14:41          | 14:42    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.5                          | -       | -       |
| Ambient out the back                | 14:45          | 14:46    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | -                            | -       | -       |
| Along the gravel strip out the back | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.4     |
| At pipe out the back                | 14:43          | 14:44    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.1                          | -       | -       |
| Under skip out the back             | 14:45          | 14:46    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.3                          | -       | -       |
| By reception                        | 14:35          | 14:36    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.34              | 0.6                          | -       | -       |
| Shop (skirting)                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.4     | 0.6     |
| Top of stairs                       | 14:32          | 14:33    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.34              | 0.7                          | -       | -       |
| Cables at ESB box in store          | 10:30          | 10:31    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |

| 22/06/2010                                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Padraic McGowan - Taurus                   |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                          | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                            | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                            |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                    | 14:48          | 14:49    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.2                          | -       | -       |
| Shop ambient reading (front of shop)       | 14:49          | 14:50    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.34              | 0.1                          | -       | -       |
| Reading around skirting boards             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Toilet (ambient)                           | 14:53          | 14:54    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.34              | 0.1                          | -       | -       |
| Toilet at waste pipe                       | 14:53          | 14:54    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.62              | 0.3                          | -       | -       |
| At back of sink                            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Shop second ambient reading (back of shop) | 14:59          | 15:00    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.81              | 0.1                          | -       | -       |
| Ambient behind counter                     | 10:25          | 10:26    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Behind counter (skirting)                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| At ESB box cable entry                     | 10:23          | 10:24    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Under stairs                               | 14:57          | 14:58    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.2                          | -       | -       |

**Note:**  
- denotes no reading taken.

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 23/06/2010                                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ann Casey - Shalomar                       |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                          | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                            | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                            |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                    | 15:29          | 15:30    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Entrance hallway                           | 15:30          | 15:31    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Around skirting board in entrance hallway  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| TV Room/Lounge                             | 16:30          | 16:31    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1013                | 0.42              | 0.2                          | -       | -       |
| Around skirting board in TV room           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Bedroom with ensuite (Room 5)              | 15:31          | 15:32    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.2                          | -       | -       |
| Around skirting board in bedroom           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.3     |
| Ensuite (ambient)                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Ensuite under sink                         | 15:32          | 15:33    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.2                          | -       | -       |
| Ensuite at toilet waste pipe               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Hallway                                    | 16:31          | 16:32    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1013                | 0.42              | 0.2                          | -       | -       |
| Smoking room                               | 16:31          | 16:32    | 0     | 0        | 0            | 0.1   | 20.8 | 79.2    | 0      | 0       | 1013                | 0.43              | 0.1                          | -       | -       |
| Around skirting board in smoking room      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Store                                      | 15:42          | 15:43    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.38              | 1.4                          | -       | -       |
| Around skirting board in store             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 1.1     | 1.3     |
| Pantry (second store)                      | 15:39          | 15:40    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.6                          | -       | -       |
| Store under stairs                         | 15:38          | 15:39    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | -                            | 0       | 0.1     |
| Room 3 (ambient)                           | 15:36          | 15:37    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Room 3 (skirting)                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Dining area of kitchen                     | 15:57          | 15:58    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.1                          | -       | -       |
| Around skirting board in dining area       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Cooking area of kitchen                    | 15:50          | 15:51    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.1                          | -       | -       |
| Around skirting board in cooking area      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Under sink 1 in cooking area               | 15:49          | 15:50    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Under sink 2 in cooking area (double sink) | 15:55          | 15:56    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Back kitchen                               | 15:51          | 15:52    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.1                          | -       | -       |
| Under sink in back kitchen                 | 15:53          | 15:54    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.1                          | -       | -       |
| Gents toilet                               | 18:45          | 18:46    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.2                          | -       | -       |
| Gents toilet at sink                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Gents toilet at wastepipe                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Disabled toilet (ambient)                  | 15:47          | 15:48    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.38              | 0.1                          | -       | -       |
| At pipes under sink                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Toilet at waste pipe                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Shower room (ambient)                      | 15:44          | 15:45    | 0     | 0        | 0            | 0.1   | 21.2 | 78.6    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Sink in shower room                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Reception (ambient)                        | 16:59          | 17:00    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Activities/games room                      | 15:59          | 16:00    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0.2                          | -       | -       |
| Around skirting board in activites room    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| Laundry room off activities room NO ACCESS | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Laundry room (beside external store)       | 17:02          | 17:03    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| External store                             | 16:34          | 16:35    | 0     | 0        | 0            | 0     | 20.8 | 78.2    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Manhole 1                                  | 16:03          | 16:04    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Drain 1                                    | 16:04          | 16:05    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Drain 2                                    | 16:05          | 16:06    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Drain 3                                    | 16:06          | 16:07    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Drain 4                                    | 16:07          | 16:08    | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0.7                          | -       | -       |
| Drain 5                                    | 16:08          | 16:09    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Drain 6                                    | 16:09          | 16:10    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.38              | 0                            | -       | -       |
| Drain 7                                    | 16:35          | 16:36    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 8                                    | 16:36          | 16:37    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 9                                    | 16:37          | 16:38    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 10                                   | 16:38          | 16:39    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 11                                   | 16:39          | 16:40    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 12                                   | 16:40          | 16:41    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 13                                   | 16:41          | 16:42    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 14                                   | 16:42          | 16:43    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 15                                   | 16:43          | 16:44    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 16                                   | 16:45          | 16:46    | 0     | 0        | 0            | 0.1   | 21   | 78.9    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 17                                   | 16:46          | 16:47    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Manhole 2                                  | 16:47          | 16:48    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Manhole 3                                  | 16:48          | 16:49    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 18                                   | 16:51          | 16:52    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 19                                   | 16:52          | 16:53    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 20                                   | 16:53          | 16:54    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 21                                   | 16:54          | 16:55    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 22                                   | 16:55          | 16:56    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 23                                   | 16:56          | 16:57    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 24                                   | 16:57          | 16:58    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Drain 25                                   | 16:58          | 16:59    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Manhole 4 (at front)                       | 17:05          | 17:06    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |
| Manhole 5 (at front)                       | 17:06          | 17:07    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.42              | 0                            | -       | -       |

| 23/06/2010                                |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ronnie Dunne - Calor Gas                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                   | 14:24          | 14:25    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.46              | 0                            | -       | -       |
| Reception office (ambient)                | 14:25          | 14:26    | 0     | 0        | 0            | 0     | 21.1 | 78.8    | 0      | 0       | 1013                | 0.41              | 0.2                          | -       | -       |
| Around skirting board in reception office | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Reception ESB cables (LHS-A)              | 13:17          | 13:18    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1012                | 0.68              | 0                            | -       | -       |
| Reception ESB cables (RHS-B)              | 13:18          | 13:19    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1012                | 0.68              | 0                            | -       | -       |
| Toilet                                    | 14:29          | 14:30    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Toilet at waste pipe                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| At pipes under sink                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Canteen/kitchen                           | 14:26          | 14:27    | 0     | 0        | 0            | 0     | 21.1 | 78.8    | 0      | 0       | 1013                | 0.41              | 0.2                          | -       | -       |
| Canteen under sink                        | 14:27          | 14:28    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.41              | 0.1                          | -       | -       |
| In shower in bathroom                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Under pump house door (no access)         | 14:31          | 14:32    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.41              | 0.1                          | -       | -       |
| Under blue container                      | 14:30          | 14:31    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.41              | 0.1                          | -       | -       |
| Brown side tin shed                       | 14:32          | 14:33    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Gantry/large pump house                   | 14:41          | 14:42    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Manhole 1 (at back of blue container)     | 14:33          | 14:34    | 0     | 0        | 0            | 0.2   | 21.0 | 78.8    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Manhole 2 (near gantry)                   | 14:50          | 14:51    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Drain 1 (under blue container)            | 14:34          | 14:35    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Drain 2                                   | 15:05          | 15:06    | 0     | 0        | 0            | 0     | 21.7 | 78.3    | 0      | 0       | 1013                | 0.52              | 0                            | -       | -       |
| Drain 3                                   | 15:06          | 15:07    | 0     | 0        | 0            | 0     | 21.7 | 78.3    | 0      | 0       | 1013                | 0.52              | 0                            | -       | -       |
| Vent (centre of yard beside gantry)       | 14:36          | 14:37    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Pipe 1 (yellow)                           | 14:37          | 14:38    | 0     | 0        | 0            | 0.2   | 21.2 | 78.6    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Pipe 2 (yellow)                           | 14:43          | 14:44    | 0     | 0        | 0            | 0.2   | 21.3 | 78.5    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Pipe 3 (yellow)                           | 14:44          | 14:45    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.41              | 0                            | -       | -       |
| Pipe 4 (metal pipe wooden cover)          | 13:20          | 13:21    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1012                | 0.68              | 0                            | -       | -       |
| Pipe 5 (set of black cables at lamp post) | 13:21          | 13:22    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.68              | 0                            | -       | -       |
| Pipe 6                                    | 13:22          | 13:23    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1012                | 0.68              | 0.4                          | -       | -       |
| Pipe 7 (metal pipe with wooden stopper)   | 13:24          | 13:25    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1012                | 0.68              | 0                            | -       | -       |
| Hole 1                                    | 13:15          | 13:16    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1012                | 0.68              | 0                            | -       | -       |
| Hole 2                                    | 13:25          | 13:26    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.68              | 0                            | -       | -       |
| Telephone box                             | 15:05          | 15:06    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1013                | 0.52              | 0                            | -       | -       |

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 23/06/2010                        |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Ms. Jeanne Dolan                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                 | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                   | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                   |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Entrance to cul de sac (ambient)  | 11:29          | 11:30    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Entrance hallway                  | 11:30          | 11:31    | 0     | 0        | 0            | 0.1   | 21.1 | 78.9    | 0      | 0       | 1013                | 0.63              | 0.3                          | -       | -       |
| Entrance hallway skirting         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Front room #1                     | 11:31          | 11:32    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.2                          | -       | -       |
| Front room #2                     | 11:32          | 11:33    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| Front room skirting               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Under stairs #1                   | 11:33          | 11:34    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| Under stairs #2                   | 11:34          | 11:35    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| Under stairs with FID             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Hall                              | 11:35          | 11:36    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.2                          | -       | -       |
| Skirting in hall                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.3     |
| Small back room with shelf        | 11:42          | 11:43    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.2                          | -       | -       |
| Small back room skirting          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Kitchen ambient                   | 11:47          | 11:48    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Under kitchen sink                | 11:48          | 11:49    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Kitchen under counter             | 11:50          | 11:51    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Kitchen skirting                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Bathroom (ambient)                | 11:36          | 11:37    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.2                          | -       | -       |
| Bathroom (skirting)               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.2     |
| Bathroom (toilet)                 | 11:37          | 11:38    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.1                          | -       | -       |
| Under bath location #1            | 11:38          | 11:39    | 0     | 0        | 0            | 0.1   | 21.1 | 78.7    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| Under bath location #2            | 11:39          | 11:40    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| All along underneath of bath      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.2                          | -       | -       |
| Toilet waste pipe                 | 11:41          | 11:42    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.63              | 0.1                          | -       | -       |
| Under bathroom sink               | 11:51          | 11:52    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Upstairs landing (ambient)        | 11:53          | 11:54    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Upstairs landing (skirting)       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| First floor room LHS (ambient)    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| First floor room LHS (skirting)   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| First floor room RHS (ambient)    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| First floor room RHS (skirting)   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| First floor room LHS location #1  | 11:54          | 11:55    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| First floor room LHS location #2  | 11:55          | 11:56    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| First floor room LHS location #3  | 11:56          | 11:57    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| First floor room RHS location #1  | 11:58          | 11:59    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| First floor room RHS location #2  | 11:59          | 12:00    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| First floor room RHS location #3  | 12:01          | 12:02    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1013                | 0.63              | -                            | -       | -       |
| Downstairs back room NO ACCESS    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Kitchen drain (outside)           | 11:44          | 11:45    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Bathroom drain (outside)          | 11:45          | 11:46    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |
| Bedroom/back room drain (outside) | 11:46          | 11:47    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1013                | 0.63              | 0                            | -       | -       |

| 24/06/2010                           |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|--------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Duncan's Island (outside)            |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                    | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                      | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                      |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Drain 1 (car park)                   | 08:39          | 08:40    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 1 (car park)                 | 08:40          | 08:41    | 0     | 0        | 0            | 0.1   | 20.5 | 79.4    | 0      | 0       | 1014                | 0.16              | 6.6                          | -       | -       |
| Drain 2 (car park)                   | 08:41          | 08:42    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1014                | 0.16              | 1.1                          | -       | -       |
| Drain 3 (car park)                   | 08:42          | 08:43    | 0     | 0        | 0            | 0.1   | 20.7 | 79.2    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Drain 4 (car park)                   | 08:43          | 08:44    | 0     | 0        | 0            | 0.1   | 20.7 | 79.2    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 2 (car park, water meter)    | 08:44          | 08:45    | 0     | 0        | 0            | 0.1   | 20.7 | 79.2    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 3 (car park, water meter)    | 08:45          | 08:46    | 0     | 0        | 0            | 0.1   | 20.8 | 79.7    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 4 (car park, water meter)    | 08:46          | 08:47    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Drain 5 (car park)                   | 08:48          | 08:49    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 5 (car park, water meter)    | 08:50          | 08:51    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 6 (car park, water meter)    | 08:51          | 08:52    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 7 (car park, water meter)    | 08:52          | 08:53    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 8 (car park, water meter)    | 08:53          | 08:54    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Drain 6 (car park)                   | 08:54          | 08:55    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 9 ((car park, water meter)   | 08:55          | 08:56    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | -                            | 100     | 306     |
| Manhole 10 (car park, water meter)   | 08:56          | 08:57    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | -                            | 350     | 800     |
| Drain 7 (SW, car park)               | 08:57          | 08:58    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | 0.7                          | -       | -       |
| Drain 8 (SW, car park)               | 08:59          | 09:00    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 11 (entrance to car park)    | 09:02          | 09:03    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | 0                            | -       | -       |
| Manhole 12 (car park, water meter)   | 09:03          | 09:04    | 0     | 0        | 0            | 0.2   | 20.8 | 79.0    | 0      | 0       | 1014                | 0.16              | -                            | 79      | 200     |
| Manhole 13 (car park, water meter)   | 09:04          | 09:05    | 0     | 0        | 0            | 0.1   | 21.0 | 79.0    | 0      | 0       | 1014                | 0.16              | -                            | 14      | 23      |
| Manhole 14 (car park, water meter)   | 09:05          | 09:06    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.16              | -                            | 163     | 347     |
| Drain 9 (SW, car park)               | 09:06          | 09:07    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1014                | 0.42              | 0                            | -       | -       |
| Drain 10 (SW, car park)              | 09:07          | 09:08    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1014                | 0.42              | 1.2                          | -       | -       |
| Manhole 15 (fire hydrant, car park)  | 09:08          | 09:09    | 0     | 0        | 0            | 0.3   | 20.5 | 79.2    | 0      | 0       | 1014                | 0.42              | 0                            | -       | -       |
| Drain 11 (SW, car park)              | 09:10          | 09:11    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1014                | 0.42              | 0                            | -       | -       |
| Drain 12 (SW, car park)              | 09:11          | 09:12    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.42              | 0.1                          | -       | -       |
| Manhole 16 (car park entrance, 'SV') | 09:12          | 09:13    | 0     | 0        | 0            | 0.1   | 20.6 | 78.3    | 0      | 0       | 1014                | 0.42              | 0                            | -       | -       |
| Pipe 1 (at back, plastic)            | 09:50          | 09:51    | 0     | 0        | 0            | 0.2   | 20.4 | 79.4    | 0      | 0       | 1014                | 0.41              | 0                            | -       | -       |
| Pipe 2 (at back, plastic)            | 09:51          | 09:52    | 0     | 0        | 0            | 0.1   | 20.5 | 79.4    | 0      | 0       | 1014                | 0.41              | 0                            | -       | -       |
| Pipe 3 (at back, plastic)            | 09:52          | 09:53    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1014                | 0.41              | 0                            | -       | -       |
| Pipe 4 (at back, plastic)            | 09:53          | 09:54    | 0     | 0        | 0            | 0.1   | 20.6 | 79.3    | 0      | 0       | 1014                | 0.41              | 0                            | -       | -       |
| Pipe 5 (at back, plastic)            | 09:55          | 09:56    | 0.3   | 5        | 0.3          | 0.4   | 20.0 | 79.3    | 0      | 0       | 1014                | 0.41              | 1207                         | -       | -       |
| Pipe 6 (at back, plastic)            | 09:56          | 09:57    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 7 (at back, plastic)            | 09:57          | 09:58    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 8 (at back, plastic)            | 09:58          | 09:59    | 0     | 0        | 0            | 0     | 20.7 | 79.3    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 9 (at back, plastic)            | 09:59          | 10:00    | 0     | 0        | 0            | 0     | 20.8 | 79.1    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 10 (at back, plastic)           | 10:00          | 10:01    | 0     | 0        | 0            | 0.1   | 20.8 | 79.1    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 11 (at back, plastic)           | 10:01          | 10:02    | 0     | 0        | 0            | 0.2   | 20.6 | 79.2    | 0      | 0       | 1014                | 0.61              | 2.3                          | -       | -       |
| Pipe 12 (at back, plastic)           | 10:02          | 10:03    | 0     | 0        | 0            | 0.3   | 20.3 | 79.4    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 13 (at back, plastic)           | 10:03          | 10:04    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 14 (at back, plastic)           | 10:04          | 10:05    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 15 (at back, plastic)           | 10:05          | 10:06    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 16 (at back, plastic)           | 10:06          | 10:07    | 0     | 0        | 0            | 0.2   | 20.5 | 79.3    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 17 (at back, plastic)           | 10:07          | 10:08    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 18 (at back, plastic)           | 10:08          | 10:09    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 19 (at back, plastic)           | 10:09          | 10:10    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 20 (at back, plastic)           | 10:10          | 10:11    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 21 (at back, plastic)           | 10:12          | 10:13    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 22 (at back, plastic)           | 10:13          | 10:14    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 23 (at back, plastic)           | 10:14          | 10:15    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |
| Pipe 24 (at back, plastic)           | 10:15          | 10:16    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.61              | 0                            | -       | -       |

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 25/06/2010                                      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Declan Caslin - Hunter's Coals                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                               | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                                 | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                                 |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient reading external to site                | 08:34          | 08:35    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.38              | 0                            | -       | -       |
| Crack (1) outside of shed (A)                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Corner of front building (location 1) (ambient) | 08:56          | 08:57    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.38              | 0                            | -       | -       |
| Shed A (RHS facing road)                        | 09:31          | 09:32    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Shed A (RHS facing road) perimeter              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 3.8     |
| Shed A (LHS facing road)                        | 10:21          | 10:22    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Shed A (ESB room)                               | 10:23          | 10:24    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Shed A (cables at ESB box)                      | 10:25          | 10:26    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Under green container                           | 09:36          | 09:37    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Under red container                             | 09:33          | 09:34    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| In crack in door of red container               | 09:34          | 09:35    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Scales/weighing room                            | 09:41          | 09:42    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Foot of gantry                                  | 09:56          | 09:57    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Small brown shed near gantry (under door)       | 09:59          | 10:00    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Ambient reading (location 3) near coal heaps    | 10:04          | 10:05    | 0     | 0        | 0            | 0     | 21.4 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Packing plant (shed B) Ambient                  | 10:15          | 10:16    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Packing plant (shed B) around perimeter         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Packing plant (shed B) under shelves            | 10:33          | 10:34    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Under ESB box (shed B) cables from above        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Tool shed in shed B                             | 10:16          | 10:17    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Canteen                                         | 09:11          | 09:12    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Canteen skirting                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| In cupboard under sink                          | 09:12          | 09:13    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block reception entrance                 | 08:51          | 08:52    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block reception entrance skirting        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office 1                                        | 08:35          | 08:36    | 0     | 0        | 0            | 0.1   | 20.9 | 79      | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office 1 skirting board                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office 1 cupboard                               | 08:36          | 08:37    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office 2 ambient                                | 08:38          | 08:39    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office 2 skirting board                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office 3 ambient                                | 08:39          | 08:40    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office 3 skirting board                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception office ambient                        | 08:40          | 08:41    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Reception office ambient (near desk)            | 08:41          | 08:42    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | -                            | -       | -       |
| Reception office skirting                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office block kitchen                            | 08:42          | 08:43    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block kitchen skirting                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office block kitchen (under sink)               | 08:43          | 08:44    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block Mens toilet ambient                | 08:44          | 08:45    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block Mens toilet at waste pipe          | 08:45          | 08:46    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block Ladies toilet (Ambient)            | 08:48          | 08:49    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block Ladies toilet at waste pipe        | 08:47          | 08:48    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Ladies toilet around pipes and skirting board   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office block hallway                            | 08:37          | 08:38    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Office block hallway (skirting)                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Declan Caslin's office (general manager)        | 08:48          | 08:49    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| General managers office skirting                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Drain 8 (SW outside entrance)                   | 10:28          | 10:29    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Locker area                                     | 09:08          | 09:09    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Toilet in locker area                           | 09:10          | 09:11    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1012                | 0.39              | -                            | -       | -       |
| Gents toilet beside locker area                 | 09:06          | 09:07    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Gents toilet beside locker area (waste pipe)    | 09:07          | 09:08    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Crack in weighbridge                            | 08:54          | 08:55    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0.2                          | -       | -       |
| Rusty pipe NO ACCESS                            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Ambient C (at rear of facility)                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ambient reading 2                               | 10:08          | 10:09    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | -                            | -       | -       |
| Ambient reading 4                               | 10:06          | 10:07    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | -                            | -       | -       |
| Ambient reading 5                               | 10:12          | 10:13    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | -                            | -       | -       |
| Drain 1 NO ACCESS                               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Drain 2                                         | 09:19          | 09:20    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 3.5                          | -       | -       |
| Drain 3 (SW drain in yard)                      | 09:26          | 09:27    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 4                                         | 09:38          | 09:40    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 21.4                         | -       | 25      |
| Drain 5                                         | 09:44          | 09:45    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 6                                         | 10:01          | 10:02    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 7 (SW drain)                              | 09:05          | 09:06    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 9                                         | 08:58          | 08:59    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 10                                        | 09:00          | 09:01    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 11 (office drain)                         | 09:03          | 09:04    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 14 (SW drain)                             | 09:21          | 09:22    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 15                                        | 09:42          | 09:43    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 16                                        | 09:54          | 09:55    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | -                            | 2.1     | 5.1     |
| Drain 17 (SW drain in car park)                 | 10:29          | 10:30    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Manhole 1                                       | 08:57          | 08:58    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 0.5                          | -       | -       |
| Manhole 2                                       | 09:01          | 09:02    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 39.1                         | -       | -       |
| Manhole 3 (by kitchen)                          | 09:14          | 09:15    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Manhole 4                                       | 09:18          | 09:19    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.39              | 24.2                         | -       | -       |
| Manhole 5                                       | 09:24          | 09:25    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Manhole 6                                       | 09:29          | 09:30    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Kitchen drain (Drain 12)                        | 09:15          | 09:16    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |
| Drain 13 (downpipe behind toilets)              | 09:16          | 09:17    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.39              | 0                            | -       | -       |

Note:  
- denotes no reading taken.



Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 25/06/2010                                   |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|----------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Sinead O'Hara - Erin Recyclers               |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                            | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                              | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                              |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                      | 11:04          | 11:05    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Entrance to reception (ambient)              | 11:06          | 11:07    | 0     | 0        | 0            | 0     | 20.9 | 79.1    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Entrance to reception (skirting)             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception (office 1)                         | 11:08          | 11:09    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Reception (office 1) around skirting board   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Conference room (ambient)                    | 11:14          | 11:15    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Conference room (skirting)                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Store (ambient)                              | 11:13          | 11:14    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Hall (ambient)                               | 11:12          | 11:13    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Hall skirting board                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Ladies toilets                               | 11:18          | 11:19    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Toilet at waste pipe                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sink at pipes                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Back office                                  | 11:17          | 11:18    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Back office (skirting)                       | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Gents toilets                                | 11:19          | 11:20    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Toilet at waste pipe                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toilet at sink pipe                          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Kitchen (ambient)                            | 11:15          | 11:16    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Kitchen (under sink)                         | 11:16          | 11:17    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Around skirting board in kitchen             | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office at front (office 2) (ambient)         | 11:09          | 11:10    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Office at front skirting board               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Office 2 ESB cables                          | 11:11          | 11:12    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Crack in weighbridge                         | 11:22          | 11:23    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.66              | 0                            | -       | -       |
| Trench at back of office with yellow pipe    | 13:27          | 13:28    | 0     | 0        | 0            | 0     | 21.3 | 78.3    | 0      | 0       | 1012                | 0.79              | -                            | -       | -       |
| Under green recycling unit location 1        | 12:38          | 12:39    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Under green recycling unit location 2        | 12:39          | 12:40    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Large grid in yard                           | 12:30          | 12:31    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 7 (black plastic beside office)         | 12:11          | 12:12    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 8 (black plastic beside office)         | 12:12          | 12:13    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 9 (cable in it, beside office)          | 12:13          | 12:14    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 10 (red, blue rope, behind office)      | 12:14          | 12:15    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 11 (orange, back of office)             | 12:15          | 12:16    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 12 (yellow in trench)                   | 12:17          | 12:18    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 13 (at diesel pump)                     | 12:31          | 12:32    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Under office building location A             | 12:20          | 12:21    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Under office building location B             | 12:22          | 12:23    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Drain 5 (at entrance)                        | 12:56          | 12:57    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 1 (behind large shed)                   | 11:30          | 11:31    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.83              | 0                            | -       | -       |
| Pipe 2 (behind large shed)                   | 11:31          | 11:32    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.83              | 0                            | -       | -       |
| Pipe 3 (at foot of stairs in shed,no cables) | 11:38          | 11:39    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.83              | 0                            | -       | -       |
| Pipe 4 (at foot of stairs, cables in it)     | 11:40          | 11:41    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1012                | 0.83              | 0                            | -       | -       |
| Front shed (ambient)                         | 11:37          | 11:38    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.83              | 0                            | -       | -       |
| Front shed location 1                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Front shed location 2                        | 11:42          | 11:43    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.83              | -                            | -       | -       |
| Front shed location 3                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Front shed at ESB cables                     | 12:05          | 12:06    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Under stairs in front shed                   | 11:41          | 11:42    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.83              | 0                            | -       | -       |
| Around inside perimeter of front shed        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Maintenance pit                              | 11:55          | 11:56    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.76              | -                            | 1.8     | 3.1     |
| Gap in wall by maintenance pit               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 5 (side of pit under steps)             | 11:57          | 11:58    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Pipe 6 at outside (beside pit, cable in it)  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 6 at inside                             | 11:59          | 12:00    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Workshop/toolshed                            | 12:01          | 12:02    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0.9                          | -       | -       |
| Around inside perimeter of tool shed         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3     | 0.7     |
| Central crack in base of tool shed           | 12:02          | 12:03    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | -                            | -       | -       |
| Under base of toolshed green side (front)    | 12:03          | 12:04    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | -                            | 3.8     | 4       |
| Under base of toolshed red side (back)       | 11:34          | 11:35    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.83              | 0.3                          | -       | -       |
| Back garage/ smaller shed                    | 12:47          | 12:48    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Back garage wall (originally trench)         | 12:50          | 12:51    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Crack in floor of garage                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Drain 1 (SW, behind large shed)              | 11:27          | 11:28    | 0.2   | 4        | 0.2          | 1.2   | 18.8 | 79.8    | 0      | 0       | 1012                | 0.79              | -                            | 830     | 874     |
| Drain 2 (SW, in front of large shed)         | 12:06          | 12:07    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Drain 3 (SW, in front of large shed)         | 12:09          | 12:10    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Drain 4 (SW, by entrance)                    | 12:18          | 12:19    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Drain 5 (long, at entrance)                  | 12:56          | 12:57    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Manhole 1 (in front shed)                    | 11:49          | 11:50    | 6.9   | >>>      | 7.4          | 3.2   | 19.1 | 71.0    | 0      | 0       | 1012                | 0.76              | 1000                         | -       | -       |
| Manhole 2 (in front of front shed)           | 12:07          | 12:08    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1012                | 0.79              | -                            | 32      | 103     |
| Manhole 3 (in front of front shed)           | 12:08          | 12:09    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1012                | 0.79              | 2.3                          | -       | -       |
| Manhole 4 (metal sheet with hole in centre)  | 12:27          | 12:28    | 0     | 0        | 0            | 0.1   | 21.9 | 78.8    | 0      | 0       | 1012                | 0.79              | -                            | 5.6     | 13.5    |
| Manhole 5 (metal sheet beside manhole 4)     | 12:28          | 12:29    | 0     | 0        | 0            | 0.3   | 21.0 | 78.7    | 0      | 0       | 1012                | 0.79              | -                            | 3.3     | 243.2   |
| Manhole 6 (in front of green recycling unit) | 12:33          | 12:34    | 0     | 0        | 0            | 0.2   | 21.0 | 78.8    | 0      | 0       | 1012                | 0.79              | 0                            | -       | -       |
| Manhole 7 (in front of green recycling unit) | 12:36          | 12:37    | 0     | 0        | 0            | 2.3   | 14.8 | 82.9    | 0      | 0       | 1012                | 0.79              | 23.6                         | -       | -       |

| 23/06/2010 - 24/06/10                     |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |             |             |
|-------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|-------------|-------------|
| Darragh Quinn - Sligo Fuels               |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |             |             |
| Location Surveyed                         | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |             |             |
|                                           | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |             |             |
|                                           |                |          |       |          |              |       |      |         |        |         |                     |                   | Stationary reading           | Minimum CH4 | Maximum CH4 |
| Ambient outdoor reading                   | 16:40          | 16:41    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.61              | 0.4                          | -           | -           |
| Under blue truck                          | 16:54          | 16:55    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -           | -           |
| Crack in ground                           | 16:53          | 16:54    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.61              | 0.3                          | -           | -           |
| Under red storage container               | 17:01          | 17:02    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.5                          | -           | -           |
| In red storage container                  | 16:58          | 16:59    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.4                          | -           | -           |
| Around inside perimeter of red container  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2         | 0.4         |
| Under blue storage container              | 16:42          | 16:43    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 2.5                          | -           | -           |
| Around inside perimeter of blue container | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2         | 0.6         |
| In blue storage container                 | 16:41          | 16:42    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1015                | 0.61              | 0.5                          | -           | -           |
| Toilet (Portaloo)                         | 16:44          | 16:45    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -           | -           |
| Reception (ambient)                       | 16:46          | 16:47    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -           | -           |
| Main office                               | 16:46          | 16:47    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -           | -           |
| Around skirting board of main office      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2         | 0.3         |
| Second office (smaller)                   | 16:49          | 16:50    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.3                          | -           | -           |
| Kitchen (ambient)                         | 16:50          | 16:51    | 0     | 0        | 0            | 0.1   | 21.1 | 78.7    | 0      | 0       | 1015                | 0.61              | 0.4                          | -           | -           |
| Around skirting board in kitchen          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.3         | 0.4         |
| Kitchen (under sink)                      | 16:52          | 16:53    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.61              | 0.5                          | -           | -           |
| ESB cables (in blue container)            | 11:45          | 11:46    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1014                | 0.51              | 0                            | -           | -           |
| Drain 1 (by diesel pumps)                 | 18:55          | 18:56    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.68              | 0                            | -           | -           |
| Drain 2 (SW drain)                        | 11:46          | 11:47    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.51              | 0                            | -           | -           |
| Drain 3 (SW drain)                        | 11:47          | 11:48    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.51              | 0                            | -           | -           |
| Drain 4 (SW drain)                        | 11:52          | 11:53    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1014                | 0.51              | 0                            | -           | -           |
| Drain 5 (SW drain)                        | 11:53          | 11:54    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.51              | 2.2                          | -           | -           |
| Drain 6 (SW drain)                        | 11:54          | 11:55    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.51              | 0                            | -           | -           |
| Grate (by red container)                  | 11:56          | 11:57    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.51              | 0                            | -           | -           |
| Manhole 1                                 | 11:48          | 11:49    | 0     | 0        | 0            | 1.9   | 17.6 | 80.5    | 0      | 0       | 1014                | 0.51              | 5.2                          | -           | -           |
| Manhole 2                                 | 11:50          | 11:51    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.51              | 30.1                         | -           | -           |
| Manhole 3                                 | 11:51          | 11:52    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1014                | 0.51              | 6.5                          | -           | -           |
| Manhole 5 (Cavanagh python, square)       | 12:02          | 12:03    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.63              | 2                            | -           | -           |

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 23/06/2010 - 24/06/10                         |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-----------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Aiden McGloin - Celtic Anglian Water Ltd      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                             | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                               | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                               |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                       | 09:28          | 09:29    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0                            | -       | -       |
| Entrance hallway                              | 09:29          | 09:30    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.5                          | -       | -       |
| Women's toilet (Ambient)                      | 09:58          | 09:59    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.44              | 0.1                          | -       | -       |
| Women's toilet at sink pipe                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Women's toilet at waste pipe                  | 10:00          | 10:01    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.44              | 0                            | -       | -       |
| Around toilet at skirting board               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.1     |
| Gents toilets ambient                         | 10:11          | 10:12    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0.4                          | -       | -       |
| Gents toilets at toilet waste pipe            | 10:12          | 10:13    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0.5                          | -       | -       |
| Gents toilets at sink pipe                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.4                          | -       | -       |
| Main hallway                                  | 10:06          | 10:07    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0.5                          | -       | -       |
| Around skirting board in hall                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Lab (ambient)                                 | 10:07          | 10:08    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | -                            | -       | -       |
| Around skirting board in lab                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.1     | 0.5     |
| By fridge and sink (crack)                    | 10:09          | 10:10    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | -                            | -       | -       |
| Under lab sink                                | 10:15          | 10:16    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1013                | 0.44              | 0.3                          | -       | -       |
| Canteen (Ambient)                             | 10:03          | 10:04    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0.1                          | -       | -       |
| Canteen (under sink)                          | 10:04          | 10:05    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.44              | 0                            | -       | -       |
| Around skirting board in canteen              | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Storage room                                  | 10:16          | 10:17    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1013                | 0.51              | 0.6                          | -       | -       |
| Storage cupboard (Health and Safety)          | 10:17          | 10:18    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1013                | 0.51              | 0.2                          | -       | -       |
| Office 1 (ambient)                            | 10:18          | 10:19    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1013                | 0.51              | 0.7                          | -       | -       |
| Office 1 around skirting board                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.4     | 0.6     |
| Office 2 ambient                              | 10:20          | 10:21    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1013                | 0.51              | 0.6                          | -       | -       |
| Office 2 at skirting board                    | 10:21          | 10:22    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1013                | 0.51              | -                            | 0.4     | 0.5     |
| Ambient outdoor                               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Locker room (ambient)                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.1                          | -       | -       |
| Generator room (ambient)                      | 09:32          | 09:33    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.3                          | -       | -       |
| Generator room (perimeter)                    | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0.3                          | -       | -       |
| Grate in generator room                       | 09:33          | 09:34    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.1                          | -       | -       |
| Perimeter of generator room                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0       | 0.2     |
| Screening room                                | 09:37          | 09:38    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.3                          | -       | -       |
| Screening room grate A                        | 09:38          | 09:39    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.2                          | -       | -       |
| Screening room grate B                        | 09:39          | 09:40    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.2                          | -       | -       |
| Screening room skirting board                 | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Workshop                                      | 09:43          | 09:44    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0.1                          | -       | -       |
| Perimeter of workshop                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sludge dewatering buffer                      | 09:47          | 09:48    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1013                | 0.18              | 0                            | -       | -       |
| Perimeter of sludge dewatering buffer         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Grate in sludge dewatering buffer             | 09:49          | 09:50    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0                            | -       | -       |
| UV plant control                              | 09:53          | 09:54    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0                            | -       | -       |
| Cable duct                                    | 09:54          | 09:55    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1013                | 0.44              | 0                            | -       | -       |
| Drain 1 (SW, weighbridge side of building)    | 10:25          | 10:26    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0.2                          | -       | -       |
| Drain 2 (SW, weighbridge side of building)    | 10:26          | 10:27    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0.2                          | -       | -       |
| Manhole 1 (weighbridge side of building)      | 10:27          | 10:28    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 2 (weighbridge side of building)      | 10:28          | 10:29    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 3 (weighbridge side of building)      | 10:29          | 10:30    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 4 (weighbridge side of building)      | 10:31          | 10:32    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 3 (SW, weighbridge side of building)    | 10:32          | 10:33    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 4 (SW, weighbridge side of building)    | 10:33          | 10:34    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 5 (weighbridge side of building)      | 10:34          | 10:35    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 5 (SW, weighbridge side of building)    | 10:35          | 10:36    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 6 (SW, weighbridge side of building)    | 10:36          | 10:37    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 7 (SW, weighbridge side of building)    | 10:37          | 10:38    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 6 (weighbridge side of building)      | 10:38          | 10:39    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 8 (SW, weighbridge side of building)    | 10:39          | 10:40    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 9 (SW, weighbridge side of building)    | 10:40          | 10:41    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 10 (SW, weighbridge side of building)   | 10:41          | 10:42    | 0     | 0        | 0            | 0.1   | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 7 (weighbridge side of building)      | 10:42          | 10:43    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 8 (weighbridge side of building)      | 10:44          | 10:45    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 11 (SW, weighbridge side of building)   | 10:45          | 10:46    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 12 (SW, beside odour control)           | 10:46          | 10:47    | 0     | 0        | 0            | 0     | 21.2 | 78.6    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 9 (beside odour control)              | 10:47          | 10:48    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0.7                          | -       | -       |
| Drain 13 (SW, beside odour control)           | 10:49          | 10:50    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 10 (beside odour control)             | 10:50          | 10:51    | 0     | 0        | 0            | 0     | 21.1 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 14 (SW, beside odour control)           | 10:51          | 10:52    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 11 (beside odour control)             | 10:53          | 10:54    | 0     | 0        | 0            | 0     | 21.2 | 78.9    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 12 (beside odour control)             | 10:54          | 10:55    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 13 (beside odour control)             | 10:55          | 10:56    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 14 (beside odour control)             | 10:56          | 10:57    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 15 (beside odour control)             | 10:57          | 10:58    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 15 (SW, beside odour control)           | 10:38          | 10:39    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 16 (beside sludge dewatering plant)   | 10:59          | 11:00    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Manhole 17 (beside sludge dewatering plant)   | 11:00          | 11:01    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |
| Drain 16 (SW, beside sludge dewatering plant) | 11:02          | 11:03    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1013                | 0.51              | 0                            | -       | -       |

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 24/06/2010                                  |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|---------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Paul McGoldrick - Cold Chon                 |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                           | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                             | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                             |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                     | 17:45          | 17:46    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow reception ambient                  | 17:36          | 17:37    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow kitchen (ambient)                  | 17:38          | 17:39    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Around skirting board in kitchen            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Bungalow kitchen (under sink)               | 17:39          | 17:40    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow toilet ambient                     | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Bungalow toilet under sink                  | 17:40          | 17:41    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow toilet at waste pipe               | 17:41          | 17:42    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow computer network room              | 17:45          | 17:46    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow main office                        | 17:44          | 17:45    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Bungalow main office skirting               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Maintenance shed (open shed)                | 18:12          | 18:13    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Vehicle maintenance pit                     | 18:13          | 18:14    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Shed/store (compressor room)                | 18:22          | 18:23    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Diesel tank                                 | 18:08          | 18:09    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Grid 1 (beside diesel tank)                 | 18:07          | 18:08    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Grid 2 (beside compressor room)             | 18:10          | 18:11    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Production plant entrance                   | 17:58          | 17:59    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Production plant                            | 17:59          | 18:00    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Production plant skirting                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Production plant control room               | 18:00          | 18:01    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Production plant control room (at cables)   | 18:03          | 18:04    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Lab (ambient)                               | 17:47          | 17:48    | 0     | 0        | 0            | 0.1   | 21.2 | 78.7    | 0      | 0       | 1014                | 0.68              | 1                            | -       | -       |
| Lab skirting                                | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | 0.2     | 0.6     |
| Lab (under sink)                            | 17:48          | 17:49    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1014                | 0.68              | 1.1                          | -       | -       |
| Lab store                                   | 17:50          | 17:51    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1014                | 0.68              | -                            | 0.6     | 0.8     |
| Cupboard in lab                             | 17:51          | 17:52    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1014                | 0.68              | 0.2                          | -       | -       |
| Reception to sales/dispatch office          | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sales/dispatch office                       | 16:53          | 16:54    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Sales/dispatch office skirting board        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Sales/dispatch store                        | 16:54          | 16:55    | 0     | 0        | 0            | 0.1   | 20.9 | 79.0    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Store skirting board                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Locker in store NO ACCESS                   | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Production office (Portacabin) ambient      | 17:21          | 17:22    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Production office skirting board            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under production office                     | 17:20          | 17:21    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Toilets (beside production office) ambient  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toilets (beside production office) at rear  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Drain 7 (toilets beside production office)  | 17:10          | 17:11    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Toilet waste pipe 1 (LHS)                   | 17:13          | 17:14    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Toilet waste pipe 2 (RHS)                   | 17:14          | 17:15    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| At shower drain                             | 17:15          | 17:16    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 8 (outside production office toilets) | 17:19          | 17:20    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Locker room                                 | 17:03          | 17:04    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Locker room skirting board                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Canteen                                     | 17:01          | 17:02    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Canteen skirting board                      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Under canteen sink                          | 17:02          | 17:03    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 5 (downpipe drain)                    | 17:07          | 17:08    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 4 (SW drain in front of locker room)  | 17:06          | 17:07    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 6 (downpipe drain)                    | 17:08          | 17:09    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Small store (oil spill gone)                | 18:17          | 18:18    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Paint store                                 | 18:16          | 18:17    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Workshop                                    | 16:57          | 16:58    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Workshop skirting                           | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Toolstore                                   | 16:58          | 16:59    | 0     | 0        | 0            | 0     | 21.1 | 78.9    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Boiler room ambient                         | 18:04          | 18:05    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Boiler room skirting                        | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Pipe 1 (boiler room entrance)               | 18:06          | 18:07    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Pipe 2 (orange plastic, by interceptor)     | 18:27          | 18:28    | 0     | 0        | 0            | 0     | 21.5 | 78.9    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Pipe 3 (black plastic, by interceptor)      | 18:28          | 18:29    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Pipe 4 (at corner of small store)           | 18:46          | 18:47    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Pipe 5 (white metal, by entrance)           | 18:48          | 18:49    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Weighbridge                                 | 18:19          | 18:20    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 3 (SW drain in yard)                  | 18:45          | 18:46    | 0     | 0        | 0            | 0     | 21.5 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 9 (roof drain at corner of bungalow)  | 17:22          | 17:23    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 10 (roof drain at corner of bungalow) | 17:24          | 17:25    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 11 (roof drain at corner of bungalow) | 17:25          | 17:26    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Interceptor                                 | 18:26          | 18:27    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1014                | 0.68              | 1.4                          | -       | -       |
| Drain 12 (SW by diesel pump)                | 18:09          | 18:10    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 13 (red brick)                        | 18:24          | 18:25    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 14 (SW drain in centre of tanks)      | 18:42          | 18:43    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 1 (SW drain in yard)                  | 18:31          | 18:32    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Drain 2 (SW drain in yard)                  | 17:27          | 17:28    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Circular hole by silver tank                | 17:28          | 17:29    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Under silver tank                           | 17:29          | 17:30    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |
| Manhole A                                   | 18:37          | 18:38    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1014                | 0.68              | -                            | 11      | 40.1    |
| Manhole B                                   | 18:38          | 18:39    | 0     | 0        | 0            | 0.1   | 21.3 | 78.6    | 0      | 0       | 1014                | 0.68              | 2.5                          | -       | -       |
| Manhole C                                   | 18:35          | 18:36    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1014                | 0.68              | 0                            | -       | -       |

Note:  
- denotes no reading taken.

Appendix M  
Table 3: Internal Survey Monitoring Results Event 3

| 24/06/2010                                      |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
|-------------------------------------------------|----------------|----------|-------|----------|--------------|-------|------|---------|--------|---------|---------------------|-------------------|------------------------------|---------|---------|
| Barry Gallagher - Greenstar                     |                |          |       |          |              |       |      |         |        |         |                     |                   |                              |         |         |
| Location Surveyed                               | GA2000 results |          |       |          |              |       |      |         |        |         |                     |                   | MicroFID results             |         |         |
|                                                 | Start time     | End time | % CH4 | %LEL CH4 | Peak CH4 (%) | % CO2 | O2   | Balance | CO ppm | H2S ppm | Barometric Pressure | Relative Pressure | VOCs equivalent to CH4 (ppm) |         |         |
|                                                 |                |          |       |          |              |       |      |         |        |         |                     |                   | Stable                       | Minimum | Maximum |
| Ambient outdoor reading                         | 14:04          | 14:05    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.9               | 0                            | -       | -       |
| In entrance grid                                | 15:00          | 15:01    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Reception hall (Ambient)                        | 14:06          | 14:07    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Reception hall around skirting board            | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Reception office                                | 14:13          | 14:14    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Front office beside reception                   | 14:12          | 14:13    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Main office (front large office)                | 14:11          | 14:12    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| ESB Room                                        | 14:09          | 14:10    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| At cables in ESB room                           | 14:10          | 14:11    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Canteen (Ambient)                               | 14:07          | 14:08    | 0     | 0        | 0            | 0.1   | 21.0 | 78.9    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Canteen around skirting boards                  | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Canteen cupboard under sink                     | 14:08          | 14:09    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Toilets (Ambient)                               | 14:11          | 14:12    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Toilets at waste pipe                           | 14:12          | 14:13    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Changing room                                   | 14:13          | 14:14    | 0     | 0        | 0            | 0.1   | 21.1 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Around changing/locker room skirting board      | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Waste depot (shed 1)                            | 15:58          | 15:59    | 0     | 0        | 0            | 0     | 21.0 | 79.0    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Waste quarantine (waste depot)                  | 15:59          | 16:00    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Small generator room (waste depot)              | 16:18          | 16:19    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Under raised concrete slab                      | 15:06          | 15:07    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Under recycling office (portacabin)             | 15:08          | 15:09    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Under door of fishmeal store (no access)        | 15:38          | 15:39    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Little shed 1                                   | 14:37          | 14:38    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Little shed 2 (toilets)                         | 14:38          | 14:39    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain A (near waste depot)                      | 15:52          | 15:53    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain B (side of office)                        | 14:30          | 14:31    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain C (SW drain)                              | 14:24          | 14:25    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain D (SW, side of fishmeal store)            | 15:46          | 15:47    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain E (SW, near waste depot)                  | 15:35          | 15:36    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.71              | 0                            | -       | -       |
| Drain F (SW, near waste depot)                  | 15:25          | 15:26    | 0     | 0        | 0            | 0     | 21.5 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain G NO ACCESS                               | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | -                            | -       | -       |
| Drain H (SW, by entrance)                       | 15:03          | 15:04    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain I                                         | -              | -        | -     | -        | -            | -     | -    | -       | -      | -       | -                   | -                 | 0                            | -       | -       |
| Drain J (SW, beside little sheds)               | 14:41          | 14:42    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain K (SW drain)                              | 14:23          | 14:24    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain L                                         | 14:29          | 14:30    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain M                                         | 14:33          | 14:34    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain N (SW, near waste depot)                  | 15:09          | 15:10    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain O                                         | 15:12          | 15:13    | 0     | 0        | 0            | 0.2   | 21.3 | 78.5    | 0      | 0       | 1015                | 0.87              | 4.1                          | -       | -       |
| Drain P (SW, near waste depot)                  | 15:13          | 15:14    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain Q (SW, near waste depot)                  | 15:14          | 15:15    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain R (SW, near waste depot)                  | 15:16          | 15:17    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain S (SW, near waste depot)                  | 15:17          | 15:18    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain T (SW, near waste depot)                  | 15:18          | 15:19    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain U (SW, near waste depot)                  | 15:20          | 15:21    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain V (SW, near waste depot)                  | 15:21          | 15:22    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain W (SW, near waste depot)                  | 15:22          | 15:23    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain X (SW, near waste depot)                  | 15:23          | 15:24    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain Y (SW, near waste depot)                  | 15:24          | 15:25    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Drain Z (SW, near waste depot)                  | 15:34          | 15:35    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.71              | 0                            | -       | -       |
| Drain 1 (SW, near waste depot)                  | 15:36          | 15:37    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain 2 (SW, near waste depot)                  | 15:43          | 15:44    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1015                | 0.75              | 1.2                          | -       | -       |
| Drain 3 (SW, near waste depot)                  | 15:44          | 15:45    | 0     | 0        | 0            | 0.1   | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 2.1                          | -       | -       |
| Drain 4 (side of fishmeal store)                | 15:47          | 15:48    | 0     | 0        | 0            | 0.1   | 21.5 | 78.4    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain 5 (by corner of waste depot)              | 15:53          | 15:54    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain 6 (by waste depot)                        | 15:55          | 15:56    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain 7 (side of office)                        | 16:16          | 16:17    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Drain 8 (mens toilet drain)                     | 14:58          | 14:59    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 1 (back of office)                         | 14:31          | 14:32    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 3 (broken ceramic, side of fishmeal store) | 14:39          | 14:40    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 4 (broken drain pipe beside little shed)   | 14:40          | 14:41    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 5 (metal, black cable, horizontal slant)   | 14:45          | 14:46    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 7 (side of waste depot, broken roof pipe)  | 15:11          | 15:12    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 8 (plastic with cables, sligo fuels wall)  | 15:15          | 15:16    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Pipe 9 (by fishmeal store)                      | 15:39          | 15:40    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Pipe 10 (by fishmeal store)                     | 15:40          | 15:41    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Pipe 11 (by fishmeal store)                     | 15:41          | 15:42    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Pipe 12 (beside waste depot)                    | 15:54          | 15:55    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Pipe 13 (High pipe)                             | 16:04          | 16:05    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Pipe 6 (by waste depot, cables in it)           | 15:05          | 15:06    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Manhole 1                                       | 14:25          | 14:26    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Manhole 2                                       | 14:26          | 14:27    | 0     | 0        | 0            | 0     | 21.3 | 78.7    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Manhole 3                                       | 14:27          | 14:28    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.87              | 3.5                          | -       | -       |
| Manhole 4                                       | 14:28          | 14:29    | 0     | 0        | 0            | 0     | 21.2 | 78.8    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Manhole 5                                       | 14:32          | 14:33    | 0     | 0        | 0            | 0     | 21.4 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Manhole 6 (lid off, beside little sheds)        | 14:42          | 14:43    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Manhole 7 (side of waste depot, fire hydrant)   | 15:31          | 15:32    | 0.4   | 7        | 0.4          | 1.1   | 19.4 | 79.1    | 0      | 0       | 1015                | 0.72              | -                            | 421     | 1800    |
| Manhole 8 (by fishmeal store)                   | 15:42          | 15:43    | 0     | 0        | 0            | 0.1   | 21.4 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Manhole 9 (by waste depot)                      | 15:45          | 15:46    | 0     | 0        | 0            | 0     | 21.4 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Manhole 10 (fire hydrant, by waste depot)       | 15:56          | 15:57    | 0     | 0        | 0            | 0     | 21.4 | 78.5    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |
| Pipe 2 (side of little shed)                    | 14:36          | 14:37    | 0     | 0        | 0            | 0     | 21.5 | 78.5    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Groundwater monitoring well (MW2)               | 15:04          | 15:05    | 0     | 0        | 0            | 0.2   | 21.2 | 78.6    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Interceptor 1                                   | 14:43          | 14:44    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Under orange container near interceptor 1       | 14:48          | 14:49    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.87              | 0                            | -       | -       |
| Under container (green) beside fishmeal store   | 16:01          | 16:02    | 0     | 0        | 0            | 0     | 21.6 | 78.4    | 0      | 0       | 1015                | 0.75              | 0                            | -       | -       |

**Note:**  
- denotes no reading taken.

# APPENDIX N

## Finisklin Landfill Site

### Gas production and migration potential

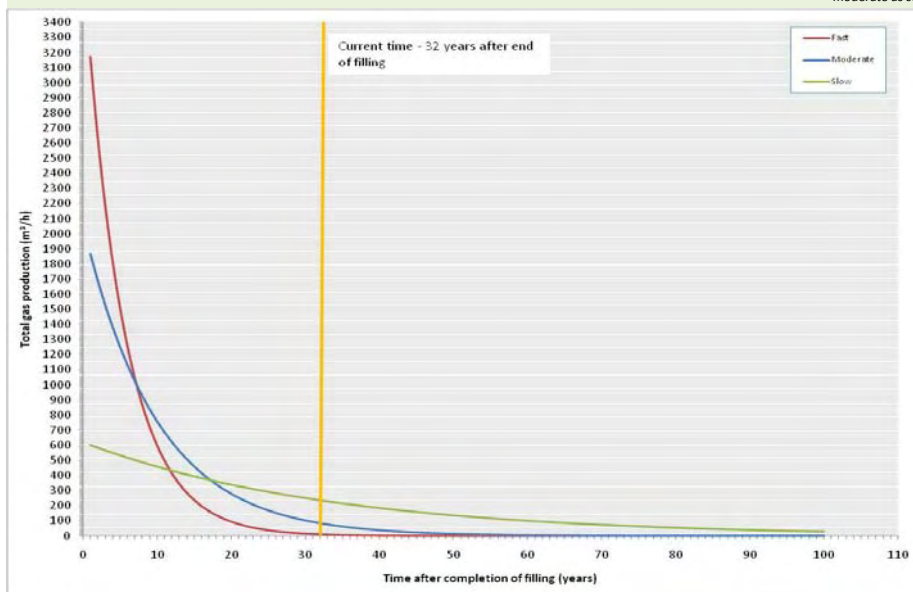
#### Older area of fill from 1958 to 1978

15% degradable content assumed for older area of landfill

### Gas production limiting values

#### Data for GASSIM generation model

|                                                                                                                         |         |         |          |                   |                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------|---------|---------|----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Length of area                                                                                                          | 320     | 320     | 320      | m                 | From plan of site                                                                                                                                       |
| Width of area                                                                                                           | 310     | 310     | 310      | m                 | From plan of site                                                                                                                                       |
| Depth of fill                                                                                                           | 8       | 8       | 8        | m                 | From borehole data - excl capping layer                                                                                                                 |
| Volume of fill                                                                                                          | 793600  | 793600  | 793600   | m <sup>3</sup>    |                                                                                                                                                         |
| Density of fill                                                                                                         | 1.4     | 1.4     | 1.4      | t/m <sup>3</sup>  | Assume density of fill - from borehole records predominatly soil so use heavier value                                                                   |
| Total weight of fill                                                                                                    | 1111040 | 1111040 | 1111040  | t                 |                                                                                                                                                         |
| Assume all fill placed and decomposition starts at end of operation period (worst case)                                 |         |         |          |                   |                                                                                                                                                         |
| Time since end of operation period                                                                                      | 32      | 32      | 32       | y                 |                                                                                                                                                         |
| Generation rate                                                                                                         | Fast    | Fast    | Moderate |                   |                                                                                                                                                         |
| Total gas production in 2010 (32 years from end of filling - using GASSIM equation for gas generation) from graph below | 10      | 10      | 84       | m <sup>3</sup> /h | Trial pit and borehole evidence indicates that more degradable proportion has degraded so use fast generation curves with moderate as sensitivity check |



#### Migration routes - proportions

|                     |      |      |      |   |                                                                                                                                        |
|---------------------|------|------|------|---|----------------------------------------------------------------------------------------------------------------------------------------|
| Vertical            | 90.8 | 90.8 | 90.8 | % | No engineered cap and landfill covers large area in proportion to depth so gas can easily migrate vertically as a preferential pathway |
| Horizontal per side | 2.3  | 2.3  | 2.3  | % | Assume evenly distributed to each of four sides                                                                                        |

#### Migration routes - volumes

|                                                                                                  |          |          |          |                                  |                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------|----------|----------|----------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vertical                                                                                         | 9.08     | 9.08     | 76.25    | m <sup>3</sup> /h                |                                                                                                                                                                          |
| Horizontal per side                                                                              | 0.23     | 0.23     | 1.94     | m <sup>3</sup> /h                |                                                                                                                                                                          |
| Surface emission rate in landfill                                                                | 9.15E-05 | 9.15E-05 | 7.69E-04 | m <sup>3</sup> /h/m <sup>2</sup> |                                                                                                                                                                          |
| Equivalent borehole flow rate within site                                                        | 0.92     | 0.92     | 7.69     | l/h                              | Total flow of landfill gas assuming Pecksen correlation                                                                                                                  |
| Horizontal migration from each side (maximum based on generation rate)                           | 9.30E-05 | 9.30E-05 | 7.81E-04 | m <sup>3</sup> /h/m <sup>2</sup> | Short side assumed to be worse case                                                                                                                                      |
| Length of typical building                                                                       | 30       | 30       | 30       | m                                | Closest buildings are industrial/commercial                                                                                                                              |
| Width of typical building                                                                        | 10       | 10       | 10       | m                                |                                                                                                                                                                          |
| Plan area of typical building                                                                    | 300      | 300      | 300      | m                                |                                                                                                                                                                          |
| Maximum vertical migration rate if gas moves upwards outside the site over plan area of building | 1.86E-05 | 1.86E-05 | 1.56E-04 | m <sup>3</sup> /h/m <sup>2</sup> | Assuming gas migrating along moves up into house into building at same rate per m <sup>2</sup> but is buffered due to difference in vertical permeability by factor of 5 |
| Equivalent borehole flow rate at point of emission outside landfill                              | 0.19     | 0.19     | 1.56     | l/h                              | Total flow of landfill gas assuming Pecksen correlation - this is the maximum being generated and thus migration cannot exceed this value                                |

#### Ventilation in existing buildings over landfill

|                                               |          |          |          |                     |                                                       |
|-----------------------------------------------|----------|----------|----------|---------------------|-------------------------------------------------------|
| Height of occupied space                      | 3        | 3        | 3        | m                   | Buildings on site are industrial/commercial           |
| Length of occupied space                      | 30       | 30       | 30       | m                   |                                                       |
| Width of occupied space                       | 10       | 10       | 10       | m                   |                                                       |
| Ventilation rate in building                  | 1        | 1        | 0.5      | Air change per hour | From BN3 - building with ground bearing concrete slab |
| Equilibrium gas concentration in the building | 3.05E-03 | 3.05E-03 | 5.12E-02 | %                   | Less than 0.1% v/v with no allowance for floor slab   |

#### Horizontal gas migration by advection - limiting values in landfill material

##### Approach from Local Authority Guide to Ground Gas

|                                              |          |          |          |                |                                                                                                                                                                                     |
|----------------------------------------------|----------|----------|----------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| K <sub>Darcy</sub> of soil migration pathway | 1.50E-04 | 1.50E-04 | 1.50E-04 | m/s            | Permeability of landfill beyond site boundary (worst case as Estuarine silts and sands likely to have lower permeability). Based on air permeability of waste quoted in literature. |
| Intrinsic permeability K <sub>i</sub>        | 1.53E-11 | 1.53E-11 | 1.53E-11 | m <sup>2</sup> | Intrinsic permeability - K <sub>Darcy</sub> x 1.02 x 10 <sup>-7</sup>                                                                                                               |



|                                                                                                                                |                                          |                     |                                |                                  |                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------|--------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit weight of methane                                                                                                         | 7.2                                      | 7.2                 | 7.2                            | N/m <sup>3</sup>                 |                                                                                                                                                                          |
| Viscosity of methane                                                                                                           | 1.03E-05                                 | 1.03E-05            | 1.03E-05                       | Ns/m <sup>2</sup>                |                                                                                                                                                                          |
| Pressure within source                                                                                                         | 20                                       | 20                  | 20                             | Pa                               | based on flow rate monitoring there is negligble pressure in the landfill                                                                                                |
| Thickness of migration pathway                                                                                                 | 9                                        | 9                   | 9                              | m                                | Total depth of landfill inc capping                                                                                                                                      |
| Width of gas migration front                                                                                                   | 500                                      | 500                 | 500                            | m                                |                                                                                                                                                                          |
| Therefore area of migration , A                                                                                                | 4500                                     | 4500                | 4500                           | m <sup>2</sup>                   |                                                                                                                                                                          |
| Migration pathway length                                                                                                       | 25                                       | 50                  | 100                            | m                                |                                                                                                                                                                          |
| Methane concentration                                                                                                          | 50                                       | 50                  | 50                             | %                                | Tyical value from wells in older area                                                                                                                                    |
| i= pressure gradient along migration route (as a fluid gradient)                                                               | 0.111                                    | 0.056               | 0.028                          | Dimensionless                    | Fluid gradient = (gas pressure/unit weight)/length                                                                                                                       |
| Q = flow of methane in m <sup>3</sup> /h through area A<br>x methane concentration                                             | 9.63E+00                                 | 4.81E+00            | 2.41E+00                       | m <sup>3</sup> /h                | $= \left[ \frac{K_i \gamma A i}{\mu} \right]$ x concentration                                                                                                            |
| Note this assumes that there are no changes to the chemical composition of the gas during migration (eg oxidation of methane). |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Maximum vertical migration rate if this moves upwards outside the site over plan area of building                              | 4.28E-04                                 | 2.14E-04            | 1.07E-04                       | m <sup>3</sup> /h/m <sup>2</sup> | Assuming gas migrating along moves up into house into building at same rate per m <sup>2</sup> but is buffered due to difference in vertical permeability by factor of 5 |
| Equivalent borehole flow rate at point of emission outside site                                                                | 4.28                                     | 2.14                | 1.07                           | l/h                              |                                                                                                                                                                          |
| <b>Vertical gas migration by advection outside site - limiting values in landfill outside site</b>                             |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Approach from Local Authority Guide to Ground Gas                                                                              |                                          |                     |                                |                                  |                                                                                                                                                                          |
| K <sub>Darcy</sub> of soil migration pathway                                                                                   | 1.50E-05                                 | 1.50E-05            | 1.50E-05                       | m/s                              | Assume vertical permeability is less than horizontal (10 times)                                                                                                          |
| Intrinsic permeability K <sub>i</sub>                                                                                          | 1.53E-12                                 | 1.53E-12            | 1.53E-12                       | m <sup>2</sup>                   | Intrinsic permeability - K <sub>Darcy</sub> x 1.02 x 10 <sup>-7</sup>                                                                                                    |
| Unit weight of methane                                                                                                         | 7.2                                      | 7.2                 | 7.2                            | N/m <sup>3</sup>                 |                                                                                                                                                                          |
| Viscosity of methane                                                                                                           | 1.03E-05                                 | 1.03E-05            | 1.03E-05                       | Ns/m <sup>2</sup>                |                                                                                                                                                                          |
| Pressure within ground                                                                                                         | 5                                        | 5                   | 5                              | Pa                               | Assume pressure is reduced outside landfill site and main driving force is stack effect inside buildings                                                                 |
| Length of soil migration pathway                                                                                               | 1                                        | 1                   | 1                              | m                                | Look at emission in 1m <sup>2</sup> column of soil                                                                                                                       |
| Width of gas migration front                                                                                                   | 1                                        | 1                   | 1                              | m                                | Look at emission in 1m <sup>2</sup> column of soil                                                                                                                       |
| Therefore area of migration , A                                                                                                | 1                                        | 1                   | 1                              | m <sup>2</sup>                   |                                                                                                                                                                          |
| Migration pathway depth                                                                                                        | 9                                        | 9                   | 9                              | m                                | Gas migration at depth in Coal Measures/Permian Marl followed by vertical migration upwards through natural rock                                                         |
| Methane concentration                                                                                                          | 80                                       | 80                  | 80                             | %                                |                                                                                                                                                                          |
| i= pressure gradient along migration route (as a fluid gradient)                                                               | 0.08                                     | 0.08                | 0.08                           | Dimensionless                    | Fluid gradient = (gas pressure/unit weight)/length                                                                                                                       |
| Q = flow of methane in m <sup>3</sup> /h through area A<br>x methane concentration                                             | 2.38E-04                                 | 2.38E-04            | 2.38E-04                       | m <sup>3</sup> /h                | $= \left[ \frac{K_i \gamma A i}{\mu} \right]$ x concentration                                                                                                            |
| Note this assumes that there are no changes to the chemical composition of the gas during migration (eg oxidation of methane). |                                          |                     |                                |                                  |                                                                                                                                                                          |
| <b>Vertical migration rate</b>                                                                                                 | 2.38E-04                                 | 2.38E-04            | 2.38E-04                       | m <sup>3</sup> /h/m <sup>2</sup> |                                                                                                                                                                          |
| <b>Equivalent borehole flow rate</b>                                                                                           | 2.38                                     | 2.38                | 2.38                           | l/h                              |                                                                                                                                                                          |
| <b>Ventilation in buildings off site</b>                                                                                       |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Maximum likely surface emission rate of gas                                                                                    | 4.28E-04                                 | 2.38E-04            | 2.38E-04                       | m <sup>3</sup> /h/m <sup>2</sup> | Use values that allow for buffering during migration                                                                                                                     |
| Height of occupied space                                                                                                       | 3                                        | 3                   | 3                              | m                                |                                                                                                                                                                          |
| Length of occupied space                                                                                                       | 30                                       | 30                  | 30                             | m                                |                                                                                                                                                                          |
| Width of occupied space                                                                                                        | 10                                       | 10                  | 10                             | m                                |                                                                                                                                                                          |
| Ventilation rate in building                                                                                                   | 1                                        | 1                   | 0.5                            | Air change per hour              | From BN3 - building with concrete ground bearing slab                                                                                                                    |
| <b>Equilibrium gas concentration in the building</b>                                                                           | 1.43E-02                                 | 7.92E-03            | 1.58E-02                       | %                                | Less than 0.1% Ignores floor slabs                                                                                                                                       |
| <b>Carbon dioxide from occupants and appliances from a typical house</b>                                                       |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Consider humans only - cooking and heating appliances will add to CO2 generation within the building                           |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Humans breath out carbon dioxide.                                                                                              |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Typically the aerage human will exhale 420 l of CO <sub>2</sub> per day.                                                       |                                          |                     |                                |                                  |                                                                                                                                                                          |
| If we say a typical house is occupied for 9 hours per day by 2 people then the total CO <sub>2</sub> emitted is                |                                          |                     |                                |                                  |                                                                                                                                                                          |
| 315 l per day                                                                                                                  |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Say area of house is                                                                                                           | 64 m <sup>2</sup>                        |                     |                                |                                  |                                                                                                                                                                          |
| Equivalent surface emission rate from ground would be                                                                          | 0.2051 l/h/m <sup>2</sup>                |                     |                                |                                  |                                                                                                                                                                          |
| Equivalent surface emission rate from ground would be                                                                          | 2.1E-04 m <sup>3</sup> /h/m <sup>2</sup> |                     |                                |                                  |                                                                                                                                                                          |
| <b>Ventilation in building</b>                                                                                                 |                                          |                     |                                |                                  |                                                                                                                                                                          |
| Height of occupied space                                                                                                       | 2                                        | m                   |                                |                                  |                                                                                                                                                                          |
| Length of occupied space                                                                                                       | 8                                        | m                   |                                |                                  |                                                                                                                                                                          |
| Width of occupied space                                                                                                        | 8                                        | m                   |                                |                                  |                                                                                                                                                                          |
| Ventilation rate in building                                                                                                   | 1                                        | Air change per hour | From BN3 - ground bearing slab |                                  |                                                                                                                                                                          |
| <b>Equilibrium gas concentration in the building</b>                                                                           | 1.03E-02                                 | %                   |                                |                                  |                                                                                                                                                                          |

## Finisklin Landfill Site

### Gas production and migration potential

Recent area of fill up to 1994

30% degradable content assumed for newer area of landfill

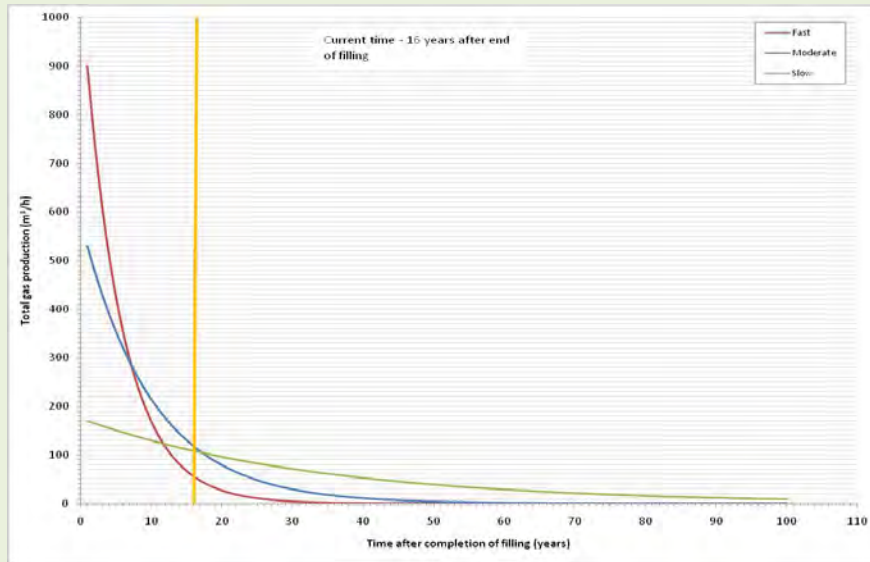
### Gas production limiting values

Data for GASSIM generation model

|                |     |     |     |   |                                                                                                         |
|----------------|-----|-----|-----|---|---------------------------------------------------------------------------------------------------------|
| Length of area | 300 | 300 | 300 | m | From plan of site                                                                                       |
| Width of area  | 210 | 210 | 210 | m | From plan of site                                                                                       |
| Depth of fill  | 5   | 5   | 5   | m | This is different from depth used in generation calcs as it is used to estimate migration pathway depth |

Assume all fill placed and decomposition starts at end of operation period (worst case)

|                                                                                                                         |      |      |          |                   |                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------|------|------|----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time since end of operation period                                                                                      | 16   | 16   | 16       | y                 |                                                                                                                                                         |
| Generation rate                                                                                                         | Fast | Fast | Moderate |                   |                                                                                                                                                         |
| Total gas production in 2010 (32 years from end of filling - using GASSIM equation for gas generation) from graph below | 56   | 56   | 118      | m <sup>3</sup> /h | Trial pit and borehole evidence indicates that more degradable proportion has degraded so use fast generation curves with moderate as sensitivity check |



### Migration routes - proportions

|                     |      |      |      |   |                                                                                                                                        |
|---------------------|------|------|------|---|----------------------------------------------------------------------------------------------------------------------------------------|
| Vertical            | 92.5 | 92.5 | 92.5 | % | No engineered cap and landfill covers large area in proportion to depth so gas can easily migrate vertically as a preferential pathway |
| Horizontal per side | 1.9  | 1.9  | 1.9  | % | Assume evenly distributed to each of four sides                                                                                        |

### Migration routes - volumes

|                                                                        |          |          |          |                                  |                                                         |
|------------------------------------------------------------------------|----------|----------|----------|----------------------------------|---------------------------------------------------------|
| Vertical                                                               | 51.81    | 51.81    | 109.16   | m <sup>3</sup> /h                |                                                         |
| Horizontal per side                                                    | 1.05     | 1.05     | 2.21     | m <sup>3</sup> /h                |                                                         |
| Surface emission rate in landfill                                      | 8.22E-04 | 8.22E-04 | 1.73E-03 | m <sup>3</sup> /h/m <sup>2</sup> |                                                         |
| Equivalent borehole flow rate within site                              | 8.22     | 8.22     | 17.33    | l/h                              | Total flow of landfill gas assuming Pecksen correlation |
| Horizontal migration from each side (maximum based on generation rate) | 9.99E-04 | 9.99E-04 | 2.10E-03 | m <sup>3</sup> /h/m <sup>2</sup> | Short side assumed to be worse case                     |
| Length of typical building                                             | 30       | 30       | 30       | m                                |                                                         |
| Width of typical building                                              | 10       | 10       | 10       | m                                | Closest buildings are industrial/commercial             |
| Plan area of typical building                                          | 300      | 300      | 300      | m                                |                                                         |

|                                                                                                  |          |          |          |                                  |                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------|----------|----------|----------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum vertical migration rate if gas moves upwards outside the site over plan area of building | 2.00E-04 | 2.00E-04 | 4.21E-04 | m <sup>3</sup> /h/m <sup>2</sup> | Assuming gas migrating along moves up into house into building at same rate per m <sup>2</sup> but is buffered due to difference in vertical permeability by factor of 5 |
|--------------------------------------------------------------------------------------------------|----------|----------|----------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                     |      |      |      |     |                                                                                                                                           |
|---------------------------------------------------------------------|------|------|------|-----|-------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent borehole flow rate at point of emission outside landfill | 2.00 | 2.00 | 4.21 | l/h | Total flow of landfill gas assuming Pecksen correlation - this is the maximum being generated and thus migration cannot exceed this value |
|---------------------------------------------------------------------|------|------|------|-----|-------------------------------------------------------------------------------------------------------------------------------------------|

### Ventilation in existing buildings over landfill

|                              |    |    |     |                     |                                                       |
|------------------------------|----|----|-----|---------------------|-------------------------------------------------------|
| Height of occupied space     | 3  | 3  | 3   | m                   | Buildings on site are industrial/commercial           |
| Length of occupied space     | 30 | 30 | 30  | m                   |                                                       |
| Width of occupied space      | 10 | 10 | 10  | m                   |                                                       |
| Ventilation rate in building | 1  | 1  | 0.5 | Air change per hour | From BN3 - building with ground bearing concrete slab |

|                                               |          |          |          |   |                                                     |
|-----------------------------------------------|----------|----------|----------|---|-----------------------------------------------------|
| Equilibrium gas concentration in the building | 2.74E-02 | 2.74E-02 | 1.15E-01 | % | Less than 0.1% v/v with no allowance for floor slab |
|-----------------------------------------------|----------|----------|----------|---|-----------------------------------------------------|

### Horizontal gas migration by advection - limiting values in landfill material

Approach from Local Authority Guide to Ground Gas

|                                              |          |          |          |                |                                                                                                                                                                                                         |
|----------------------------------------------|----------|----------|----------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| K <sub>owacy</sub> of soil migration pathway | 5.00E-04 | 5.00E-04 | 5.00E-04 | m/s            | Permeability of landfill beyond site boundary (worst case as Estuarine silts and sands likely to have lower permeability). Based on air permeability of waste quoted in literature. Use higher value as |
| Intrinsic permeability K <sub>i</sub>        | 5.1E-11  | 5.1E-11  | 5.1E-11  | m <sup>2</sup> | Intrinsic permeability - K <sub>owacy</sub> x 1.02 x 10 <sup>-7</sup>                                                                                                                                   |

|                                                                                                                                |                                          |                     |          |                                  |                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------|----------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit weight of methane                                                                                                         | 7.2                                      | 7.2                 | 7.2      | N/m <sup>3</sup>                 |                                                                                                                                                                               |
| Viscosity of methane                                                                                                           | 1.03E-05                                 | 1.03E-05            | 1.03E-05 | Ns/m <sup>2</sup>                |                                                                                                                                                                               |
| Pressure within source                                                                                                         | 50                                       | 50                  | 50       | Pa                               | Based on flow rate monitoring there is negligible pressure in the landfill, allow greater value in more recent fill and to allow for tidal influence closer to rock fill bund |
| Thickness of migration pathway                                                                                                 | 9                                        | 9                   | 9        | m                                | Total depth of landfill inc capping                                                                                                                                           |
| Width of gas migration front                                                                                                   | 500                                      | 500                 | 500      | m                                |                                                                                                                                                                               |
| Therefore area of migration , A                                                                                                | 4500                                     | 4500                | 4500     | m <sup>2</sup>                   |                                                                                                                                                                               |
| Migration pathway length                                                                                                       | 25                                       | 50                  | 100      | m                                |                                                                                                                                                                               |
| Methane concentration                                                                                                          | 80                                       | 80                  | 80       | %                                | Worse case value from wells in landfill material                                                                                                                              |
| i= pressure gradient along migration route (as a fluid gradient)                                                               | 0.278                                    | 0.139               | 0.069    | Dimensionless                    | Fluid gradient = (gas pressure/unit weight)/length                                                                                                                            |
| Q = flow of methane in m <sup>3</sup> /h through area A<br>x methane concentration                                             | 1.28E+02                                 | 6.42E+01            | 3.21E+01 | m <sup>3</sup> /h                | $= \left[ \frac{K_v \gamma A i}{\mu} \right]$ x concentration                                                                                                                 |
| Note this assumes that there are no changes to the chemical composition of the gas during migration (eg oxidation of methane). |                                          |                     |          |                                  |                                                                                                                                                                               |
| Maximum vertical migration rate if this moves upwards outside the site over plan area of building                              | 5.70E-03                                 | 2.85E-03            | 1.43E-03 | m <sup>3</sup> /h/m <sup>2</sup> | Assuming gas migrating along moves up into building at same rate per m <sup>2</sup> but is buffered due to difference in vertical permeability by factor of 5                 |
| Equivalent borehole flow rate at point of emission outside site                                                                | 57.04                                    | 28.52               | 14.26    | l/h                              |                                                                                                                                                                               |
| <b>Vertical gas migration by advection outside site - limiting values in landfill outside site</b>                             |                                          |                     |          |                                  |                                                                                                                                                                               |
| Approach from Local Authority Guide to Ground Gas                                                                              |                                          |                     |          |                                  |                                                                                                                                                                               |
| K <sub>Darcy</sub> of soil migration pathway                                                                                   | 5.00E-05                                 | 5.00E-05            | 5.00E-05 | m/s                              | Assume vertical permeability is less than horizontal (10 times)                                                                                                               |
| Intrinsic permeability K <sub>i</sub>                                                                                          | 5.1E-12                                  | 5.1E-12             | 5.1E-12  | m <sup>2</sup>                   | Intrinsic permeability - K <sub>Darcy</sub> x 1.02 x 10 <sup>-7</sup>                                                                                                         |
| Unit weight of methane                                                                                                         | 7.2                                      | 7.2                 | 7.2      | N/m <sup>3</sup>                 |                                                                                                                                                                               |
| Viscosity of methane                                                                                                           | 1.03E-05                                 | 1.03E-05            | 1.03E-05 | Ns/m <sup>2</sup>                |                                                                                                                                                                               |
| Pressure within ground                                                                                                         | 10                                       | 10                  | 10       | Pa                               | Assume pressure is reduced outside landfill site and main driving force is stack effect inside buildings                                                                      |
| Length of soil migration pathway                                                                                               | 1                                        | 1                   | 1        | m                                | Look at emission in 1m <sup>2</sup> column of soil                                                                                                                            |
| Width of gas migration front                                                                                                   | 1                                        | 1                   | 1        | m                                | Look at emission in 1m <sup>2</sup> column of soil                                                                                                                            |
| Therefore area of migration , A                                                                                                | 1                                        | 1                   | 1        | m <sup>2</sup>                   |                                                                                                                                                                               |
| Migration pathway depth                                                                                                        | 9                                        | 9                   | 9        | m                                | Gas migration at depth in Coal Measures/Permian Marl followed by vertical migration upwards through natural rock                                                              |
| Methane concentration                                                                                                          | 80                                       | 80                  | 80       | %                                |                                                                                                                                                                               |
| i= pressure gradient along migration route (as a fluid gradient)                                                               | 0.15                                     | 0.15                | 0.15     | Dimensionless                    | Fluid gradient = (gas pressure/unit weight)/length                                                                                                                            |
| Q = flow of methane in m <sup>3</sup> /h through area A<br>x methane concentration                                             | 1.58E-03                                 | 1.58E-03            | 1.58E-03 | m <sup>3</sup> /h                | $= \left[ \frac{K_v \gamma A i}{\mu} \right]$ x concentration                                                                                                                 |
| Note this assumes that there are no changes to the chemical composition of the gas during migration (eg oxidation of methane). |                                          |                     |          |                                  |                                                                                                                                                                               |
| <b>Vertical migration rate</b>                                                                                                 | 1.58E-03                                 | 1.58E-03            | 1.58E-03 | m <sup>3</sup> /h/m <sup>2</sup> |                                                                                                                                                                               |
| <b>Equivalent borehole flow rate</b>                                                                                           | 15.84                                    | 15.84               | 15.84    | l/h                              |                                                                                                                                                                               |
| <b>Ventilation in buildings off site</b>                                                                                       |                                          |                     |          |                                  |                                                                                                                                                                               |
| Maximum likely surface emission rate of gas                                                                                    | 5.70E-03                                 | 2.85E-03            | 1.58E-03 | m <sup>3</sup> /h/m <sup>2</sup> | Use values that allow for buffering during migration                                                                                                                          |
| Height of occupied space                                                                                                       | 3                                        | 3                   | 3        | m                                |                                                                                                                                                                               |
| Length of occupied space                                                                                                       | 30                                       | 30                  | 30       | m                                |                                                                                                                                                                               |
| Width of occupied space                                                                                                        | 10                                       | 10                  | 10       | m                                |                                                                                                                                                                               |
| Ventilation rate in building                                                                                                   | 1                                        | 1                   | 0.5      | Air change per hour              | From BN3 - building with concrete ground bearing slab                                                                                                                         |
| <b>Equilibrium gas concentration in the building</b>                                                                           | 1.90E-01                                 | 9.50E-02            | 1.06E-01 | %                                | Greater than 0.1% Ignores floor slabs                                                                                                                                         |
| <b>Carbon dioxide from occupants and appliances from a typical house</b>                                                       |                                          |                     |          |                                  |                                                                                                                                                                               |
| Consider humans only - cooking and heating appliances will add to CO2 generation within the building                           |                                          |                     |          |                                  |                                                                                                                                                                               |
| Humans breath out carbon dioxide.                                                                                              |                                          |                     |          |                                  |                                                                                                                                                                               |
| Typically the average human will exhale 420 l of CO <sub>2</sub> per day.                                                      |                                          |                     |          |                                  |                                                                                                                                                                               |
| If we say a typical house is occupied for 9 hours per day by 2 people then the total CO <sub>2</sub> emitted is                |                                          |                     |          |                                  |                                                                                                                                                                               |
| 315 l per day                                                                                                                  |                                          |                     |          |                                  |                                                                                                                                                                               |
| Say area of house is                                                                                                           | 64 m <sup>2</sup>                        |                     |          |                                  |                                                                                                                                                                               |
| Equivalent surface emission rate from ground would be                                                                          | 0.2051 l/h/m <sup>2</sup>                |                     |          |                                  |                                                                                                                                                                               |
| Equivalent surface emission rate from ground would be                                                                          | 2.1E-04 m <sup>3</sup> /h/m <sup>2</sup> |                     |          |                                  |                                                                                                                                                                               |
| <b>Ventilation in building</b>                                                                                                 |                                          |                     |          |                                  |                                                                                                                                                                               |
| Height of occupied space                                                                                                       | 2                                        | m                   |          |                                  |                                                                                                                                                                               |
| Length of occupied space                                                                                                       | 8                                        | m                   |          |                                  |                                                                                                                                                                               |
| Width of occupied space                                                                                                        | 8                                        | m                   |          |                                  |                                                                                                                                                                               |
| Ventilation rate in building                                                                                                   | 1                                        | Air change per hour |          | From BN3 - ground bearing slab   |                                                                                                                                                                               |
| <b>Equilibrium gas concentration in the building</b>                                                                           | 1.03E-02                                 | %                   |          |                                  |                                                                                                                                                                               |