For inspection purposes only.
Consent of copyright owner required for any other use.

BORD GÁIS

November 2003

Limerick Gasworks, Dock Road, Limerick

Ground Investigation into Boundary Groundwater Conditions and Quarry Backfill

Report Reference: 25837/R/11 B

EPA Export 29-05-2012:04:38:58

REPORT CONTROL SHEET

BORD GÁIS

PROJECT NAME **Limerick Gasworks Dock Road, Limerick**

REPORT TITLE **Site Investigation, Ground Investigation into Boundary Groundwater Conditions and Quarry Backfill**

REPORT REFERENCE **25837/R/11 B**

	Prepared by:	Checked by:	Approved by:
First Issue	**Owen Kelly November 2003**	**David Field November 2003**	**John Crowther November 2003**
Second Issue Paras 3.1 & 3.32 revised re BTEX values in BH38A plus comment on DNAPL in BH7&38A	**Owen Kelly November 2003**	**David Field November 2003**	**Tony Brown November 2003**

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:58

CONTENTS

EXECUTIVE SUMMARY V

SECTION 1: INTRODUCTION 1

1.1 Terms of Reference 1
1.2 Form of Report 2

SECTION 2: SITE DETAILS 3

2.1 Site Location 3
2.2 Site Description 3
2.3 Local Environmental Context 3
2.4 Geology, Hydrology and Hydrogeology 4
2.5 Hydrology 4
2.6 Hydrogeology 4
2.7 Site History 5
2.8 Assessment of Previous Site Investigations 5
2.8.1 Description of Works Undertaken 5
2.8.2 Details of Ground Conditions 6
2.8.3 Details of Analysis 7

SECTION 3: GROUND INVESTIGATION 10

3.1 Field and Laboratory Work 10
3.2 Ground Conditions 11
3.2.1 Quarry Area 11
3.2.2 Site Perimeter - West and North 12
3.2.3 Rock Outcrop - South East Corner 13
3.2.4 Limestone Wall 14
3.2.5 Drain encountered during main drainage works 14
3.2.6 Chemical Ground Conditions 14
3.3 Groundwater Conditions 18
3.3.1 Groundwater Levels 18
3.3.2 Groundwater Quality 18
3.4 Other parameters 26
3.4.1 Fraction of Organic Carbon. 26
3.4.2 Point load tests 26

SECTION 4: CONCLUSIONS 28

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:38:58

DRAWINGS

Figure 1 - Site Location
Figure 2 - Site layout and levels
Figure 3 - Exploratory Hole Location plan with estimated rock contours and extent of quarry
Figure 4 - Site Sections (Geology)

APPENDICES

APPENDIX A - GEOTECH SPECIALISTS – FACTUAL REPORT

APPENDIX B – PARKMAN TRIAL PIT LOGS

APPENDIX C – CHEMICAL RESULTS

APPENDIX D – GROUNDWATER LEVEL MONITORING RESULTS

APPENDIX E - FRACTION OF ORGANIC CARBON RESULTS

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:58

EXECUTIVE SUMMARY

Terms of Reference.	Parkman appointed April 2003 to design, supervise and interpret additional site works to investigate groundwater conditions, towards the site boundary, hydrogeologically downgradient from the site. Works also to include more detailed investigation of materials within the former quarry area. Results to enable the QRA/remediation design to be refined.
Location	Site lies south east of Dock Road in Limerick and approx. 100m from the Shannon.
Site History	A limestone quarry extended over most of the eastern quadrant of the site prior to 1870. The gasworks was established to the west of the quarry in 1830 and expanded, over time, including over the quarry area, which was backfilled. The arrival of natural gas to Limerick in 1986 made the generating plant redundant at most of the above-ground structures were demolished by 1988.
Geology	Made Ground, particularly in the quarry overlies the lower carboniferous limestone, which is visible at the surface to the south east of the site, and falls to the north west, towards the Shannon. The bedding is reported as dipping at 8 to the north. Some alluvial deposits may be present below the Made Ground in places.
Hydrogeology	The limestone is considered to be a locally important aquifer and classified as 'vulnerable' due to lack of impermeable cover. The nearest recorded abstraction well is 6km to the south east, hydrogeologically upgradient from the site. Groundwater appears to be at shallow depth (1.5-2mbgl) and in hydraulic continuity between the superficial deposits and the rock, and potentially controlled by the Shannon to the south west with a typical level of 3m OD. The hydraulic gradient is approx. 1 in 25 to the north west, towards the Shannon, with no apparent tidal variations present on site.
Previous Site Investigations	Three previous site investigations have been carried out in 1990, 1995 and 2001, comprising a total of 44 trial pits and 16 boreholes. Results have shown the site to be contaminated particularly by tar products, PAH's, BTEX, but also by cyanide and some heavy metals with groundwater condition of pits.
Site Investigation	Four pairs of boreholes (shallow and deep) were installed into the rock as close as possible to Dock Road and O'Curry Street on the northern side of site. 10 trials to a maximum depth of 5.7m and 5 percussion boreholes investigated the quarry area. Other pits to investigate tar pipes, well foundations and worked limestone. Groundwater monitored over 3 post-site works visits.
Results	Made Ground within quarry varies in consistency in both plan and elevation, with no evidence of layering. Principal soil contaminants appear to be PAH and cyanides related to initial screening, with benzene, copper, arsenic, sulphide, chlorides being the main contaminants relative to the preliminary QRA. Groundwater monitoring confirmed a hydraulic gradient of 1:25 towards the Shannon. Groundwater sampling and analysis showed little evidence of any reductions in contamination levels between the main body of the site and the boreholes around the site boundary.

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:38:59

SECTION 1: INTRODUCTION

1.1 Terms of Reference

Parkman's letter to Bord Gáis Éireann dated 25 April 2003 sets out the proposal for the present work, identifying the reasons for the investigation and its aims. John Boylan verbally confirmed for these investigations to be carried out with the Quantitative Risk Assessment (QRA) then to be reviewed. This Report relates solely to the reporting of the ground investigation results; revision of the QRA is carried out and reported separately.

Previous site investigations have identified the contamination on the site. They have also shown that the site is in direct hydraulic continuity with the underlying limestone aquifer and thus also with the River Shannon which lies 100m to the west.

The very short pollutant linkage path between source (site contamination) and receptor (river Shannon and the underlying aquifer) would appear to provide little or no opportunity for any dilution or degradation to occur to the contamination. The result of this is very onerous Remediation Target Values (RTV) are required on the site to remove the risks to these receptors.

This investigation was therefore designed to investigate if groundwater conditions in the rock at the site boundary show any evidence of reduction in contamination levels from that of the 'source' in the main body of the site. If this were found to be so, then this would show that the rock itself acts as a barrier to contaminant migration, thus reducing the risk to the Shannon and any abstractions from the rock aquifer. This would allow less onerous RTV's to be adopted for the site.

Consent of copyright owner required for any other use.
For inspection purposes only.

The investigations were also to assess in more detail the ground conditions within the former quarry. The quarry is potentially a major source of contamination and further information was required to confirm the degree of contamination, its distribution and the soil types so that the extent and form of any remediation can be suitably designed.

This report has been prepared by *Parkman Environment* on the basis of the available information received during the study period. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed.

Parkman also used reasonable skill, care and diligence in the design of the investigation. The inherent infinite variation of ground condition allows only definition of the actual conditions at the location and depths of exploratory holes, while at intermediate locations conditions can only be inferred.

To a degree the completeness of the investigation was restricted by the need to avoid existing services, access and installations and also by the inability to access land owned by Limerick Harbour Commissioners.

This report has been prepared and written for the exclusive benefit of Bord Gáis for the purpose of providing environmental information relevant to the potential statutory liabilities of the site and relevant to its development. The report contents should be only used in that context. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

EPA Export 29-05-2012:04:38:59

1.2 Form of Report

The Report is divided into 4 sections as follows:

- **Introduction**: This identifies the Terms of Reference and Form of Report.
- **Site Details**: This summarises the history of the site, its geology, hydrogeology, the extent of previous investigations and their results.
- **Ground Investigation**: This sets out the aims of the present investigation, the extent of site works and summarises the factual results.

  The results of the present investigation are reviewed by comparison of the groundwater monitoring results against the RTU values generated by the previous QRA. In addition, the contents of the quarry are also reviewed in conjunction with previous results, to provide an assessment of its overall condition with consideration given to remediation requirements.
- **Conclusions**: The results of the investigations are summarised and recommendations given.

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

SECTION 2: SITE DETAILS

2.1 Site Location

Limerick gasworks lies to the south-east of the Dock Road in the City of Limerick, approximately 100m from the River Shannon. The Shannon Bridge lies approximately 400m to the north-east of the site. The approximate National Grid co-ordinates of the site are E 157600 N 157200 (see also Figure 1).

Access to the site is either from Dock Road, which forms the north-western site boundary, or from O'Curry Street, which forms the north-eastern boundary.

2.2 Site Description

The site is approximately rectangular, 130m x 110m, and covers an area of 1.4 hectares (3.5 acres) including the "house pound" area in the northern corner, adjacent to the junction of Dock Road and O'Curry Street. Part of the site was a former limestone quarry and rock faces are evident on the north-eastern and south-eastern boundaries.

The main area of the site is generally level at about 5.00m OD (Malin Head Datum) but it rises to approximately 8.00m OD towards the site boundaries to the south and east (see Figure 2).

The site is used as a depot for Bord Gáis, and includes a two-storey office adjacent to the south-west boundary. Other buildings on-site include a derelict former store building constructed of stone in the eastern corner and various other smaller brick buildings including the former No.'s 3 & 4 Store, the former Naphtha Process Control building (two-storey), ESB sub-station and the former Governor House.

For inspection purposes only.
Consent of copyright owner required for any other use.

2.3 Local Environmental Context

Limerick Corporation report that they are not aware of any other substantial sources of contamination within 500m of the gasworks site.

There are no known landfills within 500m of the site.

There are no statutory nuisances within 500m of the site.

Limerick Corporation sewers presently discharge into the River Shannon although a new main drainage scheme is currently being constructed and will subsequently collect all such discharges and route them to a new sewage treatment facility.

The works for the new drainage scheme enabled the inspection of an old egg-shaped sewer under the Dock Road, adjacent to the site. The inspection identified a significant quantity of material comprising soil and hydrocarbons in the vicinity of the Bord Gáis site. Testing suggested that the material had a similar PAH signature to that of on-site materials.

EPA Export 29-05-2012:04:38:59

A further 600mm diameter concrete pipe, reportedly full of tar, was also encountered coming out of the site into Dock Road, with an invert level 2.5m below ground level, apparently just to the south of Gasholder No.1.

2.4 Geology, Hydrology and Hydrogeology

The Geological Survey of Ireland Sheet 17 Limerick, 1:100,000 Scale, the "Geology of the Shannon Estuary" and the local geological memoir indicate that the bedrock beneath the site comprises the Visean Limestones of the Lower Carboniferous Period. These limestones are 'oolitic' (small (…1mm diameter) carbonaceous accretionary bodies cemented together, resembling fish eggs) in places, representing a shallow marine carbonaceous shelf depositional environment. These deposits occasionally contain clay 'wayboards', which formed when the limestone was periodically exposed above sea level. The limestone often contains chert nodules (siliceous concretions) and thin interbedded shales. The Visean Limestone is also known as 'Clean Shelf Limestone'. It is over 800m thick and lies conformably on the Waulsartion Limestone, described as a massive unbedded lime mudstone representing a deeper marine depositional environment.

Beneath the site, the beds dip 8° to the north. The site is located on the southern limb of an east-west trending syncline.

The rockhead is close to the surface with little or no drift cover. Where drift is present, it is likely to comprise very recent fill (made ground used as backfill in the construction of the gasworks and infilling of the quarry) or Recent alluvium associated with the River Shannon flood plain.

For inspection purposes only.
Consent of copyright owner required for any other use.

2.5 Hydrology

The site is situated on the southern bank of the Shannon River, which flows westwards towards the Atlantic Ocean. The Shannon River is tidally affected at this point.

The site presently comprises approximately 60% hard cover and 40% free draining material (with many underground structures that may impinge on the flow of water through the made ground). There is a slight fall in the site level from the south-east (8m OD) to the north-west (5m OD), and so any surface infiltration that does not enter the surface drainage system will tend to flow in the fill materials towards the north-west corner, i.e. towards the River Shannon. The River Shannon water level is typically 3m OD near the site.

Drainage of the site is to the city's sewers, which discharge directly into the river. The 'Site Investigation Report - Limerick Gasworks Site' by Ove Arup records that storm water flooding has occurred in the past along the Dock Road at its junctions with O'Curry Street and Alphonsus Street, i.e. close to the site.

The maximum recorded flood level for the City is reported as 4.25m OD (Malin Head).

2.6 Hydrogeology

The Groundwater Protection Maps for County Limerick (Maps 1-6) indicate that the Clean Shelf Limestone is a 'Locally Important Aquifer' that is generally Moderately Productive (40-100m^3/d).

EPA Export 29-05-2012:04:38:59

The aquifer is controlled by fissure flow and well-developed karst features have been observed in the area. The nearest abstraction well is 6 km to the south-east of the site. The oolitic limestones of the Limerick Syncline are known to have relatively high permeabilities. The aquifer is considered 'Vulnerable' due to the lack of impermeable cover.

The majority of the ground water is hard, containing calcium bicarbonate ($Ca(HCO_3)_2$). Iron and manganese have been found in elevated concentrations west of Limerick. Elevated nitrates have been encountered in some locations due to agricultural activities. Groundwater quality of smaller, shallower sources is generally poorer than the larger, deeper sources.

There are no recorded active wells or boreholes in the vicinity of the site although the historical site plan dated 1977 shows a well 5m to the north west of Gasholder No3 (T11).

It is likely that hydraulic continuity exists between the Made Ground/Alluvial deposits and the bedrock.

The proximity of the site to the tidal inlet of the River Shannon would suggest the potential for groundwater on site to be tidally affected; this would need to be confirmed by on-site monitoring.

Consent of copyright owner required for any other use.
For inspection purposes only.

2.7 Site History

A limestone quarry extended over most of the eastern half of the site prior to 1840 and until the end of the 1800's. The gasworks was established to the north west of the quarry in the 1830's. Several generations of gasworks producing 'town' gas occupied the site until gas manufacture was converted to oil gas production in the late 1960's / early 1970's. The arrival of natural gas to Limerick in 1986 made the generating process redundant and the majority of the above ground structures were demolished by 1988.

2.8 Assessment of Previous Site Investigations

2.8.1 Description of Works Undertaken

Three site investigations have been carried out previously to assess the level of contamination on site. Figure 3 shows the layout of the boreholes and trial pits.

The first was carried out in 1990 by Gibb Environmental (environmental sampling) and Irish Geotechnical Services Limited (trial pitting and borehole excavation) under the direction of O'Connor Sutton Cronin and Associates Limited. This comprised ten trial pits (TP 1-10) to between 1.4m and 2.3m deep and six boreholes (BH1-6) to between 4m and 7.6m deep, the latter to prove rock.

Twenty-one soil samples were analysed for pH, sulphate, sulphide, cyanide (total & free), phenols, and toluene extractable material, with four also analysed for speciated PAH's and calorific value. Four water samples were analysed for pH, ammonia nitrogen, sulphate, total organic carbon (T.O.C.), total cyanide and total phenols as tar acids. One sample of water and one sludge sample were analysed for speciated PAH's.

The second investigation was carried out by K T Cullen and Company and Glover Site Investigations Limited under the direction of Ove Arup & Partners in 1995. It comprised 17 trial

EPA Export 29-05-2012:04:38:59

pits (TP 11-27) to between 0.15 m and 3.7m deep and 6 boreholes (BH 7-12) to between 5m and 11.8m deep and 5 surface (scraped) samples.

Fifty-five soil samples were analysed for pH, sulphates, total cyanide, toluene extractable material and total phenols. Based on the results obtained, selected samples were then subjected to analysis for dependant options comprising PAH'S, BTEX, free & complex cyanide, thiocyanate and water soluble sulphate.

In addition, selected samples were also analysed in respect of metals, mineral oils and total VOC's and a further two were the subject of a leachability test.

Twenty-three water samples were taken and analysed for a suite comprising total phenols, sulphide, ammoniacal nitrogen, total cyanide, speciated PAH's, pH, temperature and conductivity. Eleven samples were also subjected to a suite of tests including organic and inorganic determinands.

Monitoring was carried out subsequently on two occasions in respect of groundwater levels and gas levels.

The results of both investigations are reported and discussed in Ove Arup's April 1996 Site Investigation Report on Limerick Gasworks Site.

Consent of copyright owner required for any other use. For inspection purposes only.

The third investigation was carried out by Geotech Specialists Ltd, under the direction of Parkman Environment, in February-March 2001. It comprised seventeen trial pits (TP31-43, 47-49,51)to a maximum depth of 3.5m and four rotary boreholes (BH 31-34)by open hole drilling, all extending a minimum of 3m into rock and to a maximum depth of 10.25m.

43 Soil samples from site were analysed for a standard suit of determinands including BTEX's, TPH's and speciated PAH's. 20 of the soil samples were also subjected to leachate testing.

Water samples were analysed for a similar set of determinands to those adopted for the soils. They included 16 samples taken during the actual site works with a further 18 samples taken over three site monitoring visits from the four boreholes recently installed, plus samples from 3 of the earlier boreholes.

Gas and water level monitoring was also carried out on two site visits from the four boreholes, with one of the previous boreholes monitored also on one visit.

2.8.2 Details of Ground Conditions

The following succession of strata was identified from the three previous investigations :-

EPA Export 29-05-2012:04:38:59

Table 2.5.2 Summary of ground conditions (1990 and 1995 investigations)

Stratum	Thickness (m)	
	Range	Average
Made Ground	0.2 – 7.3	2.4
Alluvium/reworked Alluvium	0.0 – 5.7	N/A
Limestone	8.43m proven	

The Made Ground was found to be variable in nature and consistency. It contains sand, gravels, cobbles, clays, brick rubble, spent oxides, ash, concrete etc. and was often contaminated with tarry liquid and occasionally had a strong phenolic odour. The deepest thicknesses of made ground were associated with the old quarry and underground tanks/gasholder bases.

Alluvial deposits are thought to be present in the western half of the site adjacent to Dock Road, although these have been disturbed by foundation construction and hence are often generally described as Made Ground. They comprise loose to medium dense brown-grey sandy gravels and brown soft silty clays with gravels and occasional cobbles and boulders.

The top 0.5m to 1.0m of the bedrock was generally weathered and comprised gravel to boulder size fragments of angular limestone. Below this level, the bedrock comprised strong dark to medium grey coarse grained fresh, bedded Limestone. Total Core Recoveries (TCR) were in the range 14% to 100% with an average of 76%. Rock Quality Designation (RQD) values were also in range 14% to 100% with an average of 64%. The rockhead was often described as "stained with black tar" over a depth of up to 3m.

Consent of copyright owner required for any other use. For inspection purposes only.

The bedrock surface was found to be very uneven due to previous quarrying activities and excavation for underground tanks and tank foundations. The natural slope of the bedrock is from approximately 7m OD at the southern boundary to 3m OD at the northern boundary.

Rockhead was encountered at a depth of over 8m (-1.6m OD) in BH10 and BH11 in the north eastern half of the site. This relates to the former quarry, which is shown on the historical map for 1872.

The quarry appears to have a steep face to the north-west, with its base rising more gently to the east; BH34 and BH2 showing rockhead at around 0.5 m OD, with up to 5.5 m OD at BH8 by the eastern (south eastern) boundary.

Groundwater was encountered in the trial pits and boreholes at depths between 0.3m and 2.8m in the Made Ground. The general direction of groundwater flow was found to be west/north-west towards the River Shannon from a level of approximately 7m OD on the eastern side of the site to approximately 3.5m OD on the northern side of the site (The River Shannon water level is typically 3m OD near the site).

2.8.3 Details of Analysis

Initial screening of the site investigation data was undertaken using the UK ICRCL Threshold Trigger Values (least sensitive end use) for soils (where available), with the Dutch Intervention Values considered for soil contaminants not covered by the ICRCL list. The only exception to this was in the case of PAH where screening assessment criteria was set at the Acton Trigger

EPA Export 29-05-2012:04:38:59

Level for the most sensitive end use. Figure 6 in the Phase I report identified the soil samples where contamination levels exceeded these initial screening levels.

This screening provided a basic assessment of the areas of site requiring remedial action. Any subsequent assessment should be based on the results of the site specific quantitative risk assessment.

In general, the most significant soil contamination at Limerick gasworks was organic, with evidence of heavy staining by tars and tarry liquid with a phenolic odour being encountered in most of exploratory holes, particularly over the south western part of the site. The most common determinands at elevated levels were PAH, TPH, phenols, cyanide, benzene, toluene and xylene. Tarry staining penetrated into the bedrock joints in BH's 7, 8, 10 and 11. Elevated levels of organic contaminants were encountered in TP's 1, 2, 8, 15, 19, 22, 23, 24, 32, 35, 38, 39, 47, 48, 49 and 51, mostly in the vicinity of former tanks. The contamination is most likely due to spillages and leaks from the tanks. Visual evidence of spent oxide ("blue billy") was encountered in the central area of the site (old quarry area), with associated elevated cyanide levels (TP's 33, 39 and 49).

Generally there were no significantly elevated metal levels found at the site, with the exception of the area around the chimney of the original gasworks (in the vicinity of T12), where the elevated levels appear to be associated with ash deposits.

The groundwater encountered in the trial pits on the western side of the site during the first two investigations were contaminated with heavy oils and oozing tarry liquid. Floating product with globules of tarry material was detected in three of the sixteen trial pits; these were associated with buried structures (e.g. tar tanks). Tarry liquid was discovered to have penetrated downwards into the joints of the bedrock across the central area of the site.

Elevated levels of contaminants (principally PAH, benzene, xylene, cresol, phenol, sulphates and cyanide) in groundwater occurred in generally the same areas as elevated levels of soil contamination, possibly suggesting that the groundwater is not very mobile. Generally, no significantly high metal concentrations were detected in the groundwater, except in trial pits 15, 18, 34, 35 and 47, BH7 and BH10.

The results of chemical testing on the surface samples scraped from the masonry walls around the site showed elevated levels of sulphates and various organics.

The results of leachate testing showed that the potential for leaching was low, the measured concentrations being generally less than 0.1% of the original value. The exceptions were some cyanides (0.03 to 71%), phenols (0.8 to 65%) and ammonia (3 to 20%).

Elevated levels of methane (>1%) were recorded within borehole monitoring installations during a total of seven visits in BH's 7, 8 and 10 although the most significant levels (up to 90%) were recorded in BH12. The levels of methane recorded were generally significantly higher than the explosive limit (5 – 15%). The velocity of the gas flow was measured and found to be negligible. A tube sample of gas was taken from BH12 and analysed using GCMS. Traces of Kinsale Natural Gas were detected, suggesting that the elevated methane levels may have been due to a leak in a nearby gas main.

Monitoring of BH's 11, 31, 32, 33 and 34 on two occasions in 2001 recorded only one methane concentration, of 0.3%, in BH33.

For inspection purposes only. Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

Levels of carbon dioxide ranged between 1.7 – 3.2% in BH's 7, 8, 10 and 12. Levels of oxygen were reduced significantly in all boreholes and were accompanied by elevated levels of carbon dioxide and methane. No hydrogen sulphide was found in any of the standpipes. Monitoring of Boreholes 11, 31, 32, 33 and 34 in 2001 encountered carbon dioxide of up to 0.2% with an oxygen depletion to 15.9% in BH32. Hydrogen sulphide was not monitored for.

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

SECTION 3: GROUND INVESTIGATION

3.1 Field and Laboratory Work

The site investigation was designed and supervised by Parkman who also scheduled the analysis of soil and water samples an rock sample testing, and carried out post-siteworks borehole monitoring and water sampling.

The ground investigation was carried out by Geotech Specialists Ltd between 24th July and 18th August 2003. Cable percussion boreholes were sunk at seven locations with rotary drilling at, or adjacent to, two of these locations whilst at two other locations only rotary drilling was carried out. Rotary work included open holing to rock with coring in the rock.

Pairs of holes were located at four positions along the north-west site boundaries, one penetrating 3m into the top of the rock and second extending 8m into rock. Both were fitted with standpipes to allow the groundwater to be sampled subsequently, within the weathered and unweathered zones.

Trial pits using a tracked machine were dug at 10 locations to a maximum depth of 5.7m. The holes were principally within or around the perimeter of the former quarry and logged by Parkman staff who also took and scheduled samples for chemical analysis.

The five other cable percussion boreholes investigated the quarry area, proved the depth to rock, provided samples for chemical analysis and included standpipes for subsequent groundwater monitoring and sampling/analysis.

Consent of copyright owner required for any other use. For inspection purposes only.

Samples of soil and water selected for chemical analysis were sent to Alcontrol Geochem Limited in Chester, UK. Analysis was carried out in accordance with Lattice Property Holdings (now known as SecondSite Property Holdings) Guidance for Assessing the Potential Contamination on Gasworks Sites, Version 2.6.

Additional testing was carried out in respect of Fraction of Organic Carbon (FOC) both in the superficial deposits and in the rock, plus point load tests on selected samples of rock core.

Monitoring of water levels and sampling of the water in the boreholes for subsequent chemical analysis was carried out by Parkman staff on three occasions.

The first occasion was at the end of siteworks and included the development of the borehole by the purging of up to three volumes of water relative to the borehole diameter prior to water sampling. Water samples were then taken; samples for metal analysis were not filtered and no preservative was added, filtering being carried out at the laboratory on receipt. Other samples were preserved on site as appropriate.

On the second occasion, no purging was carried out, with water samples being taken, as before, for laboratory filtering and analysis.

A similar regime was carried out on the third visit, but on this visit, dense non-aqueous phase liquid (DNAPL) was also sampled for analysis where it was found in BH 7 and BH38A. These latter samples were analysed as soils and included VOC and SVOC analysis.

EPA Export 29-05-2012:04:38:59

The layout of the boreholes and trial pits is shown on Figure 3.

Borehole logs and the results of rock testing are included in Geotech Specialists Ltd's Report No. KC3168, a copy of which is included in Appendix A.

Trial Pit logs, by Parkman, are included in Appendix B.

Chemical results from Alcontrol Geochem are provided in Appendix C, with FOC results included separately in Appendix E.

Groundwater level monitoring results are included in Appendix D.

3.2 Ground Conditions

3.2.1 Quarry Area

The former quarry shown on the 1840 and 1870 historical plans was targeted with a total of 13 trial pits, 6 cable percussion boreholes and one rotary drilled borehole. The information gathered from these positions has been combined with the information gathered during previous investigations to describe the contents of the quarry. For ease of description, the quarry area is described in cross section from north to south.

For inspection purposes only.
Consent of copyright owner required for any other use.

The north-western side of the quarry was thought from plans to be the deepest, as water was shown to be ponded in this area on the 1872 Ordnance Survey of Ireland map. The relevant excavations in this area comprised BH's 6, 11, 12, 35 and 39 and TP's 57, 55E, 55, 8, 34, 56, 56E, 101, 102 and 103.

In general, the trial pits and boreholes encountered mixed Made Ground variable in nature, but generally granular in the upper metre and cohesive below this. BH39 proved more granular fill material at depth. Many ground obstructions comprising brick and concrete structures were encountered along the north west side of the former quarry, associated with the later development of the gasworks. This meant that many of the borehole positions planned for this site investigation had to be moved to avoid obstructions.

Rockhead was encountered at +1.87m OD in BH35A and -1.11m OD in BH39. In BH's 6, 11 and 12 from previous excavations, rockhead was encountered at +5.66 m OD, -1.64m OD and –0.49m OD respectively. Figure 3 includes approximate rockhead contours estimated from the results of the investigation.

Visual and olfactory hydrocarbon contamination was noted in the majority of the excavations in this area, specifically in BH's 11 and 39, i.e. the deepest part of the quarry.

Groundwater was encountered within the Made Ground at varying levels during the site investigation works in the boreholes. Post-works groundwater monitoring results are included in Appendix D and are discussed in Section3.3 below.

The mixed nature of the fill material as well as the hydrocarbon contamination patches within it suggest that the quarry was infilled in an ad-hoc manner with material from excavations elsewhere on-site (i.e. for foundations in the gasworks development) and contaminated materials generated from the gasworks process itself.

EPA Export 29-05-2012:04:38:59

The central area of the quarry was investigated by BH's 2, 3, 4, 40, 41 and TP's 3, 9, 10, 12, 38 and 53. In general, the trial pits and boreholes encountered mixed Made Ground variable in nature with mixed granular and cohesive Made Ground throughout the area. Many ground obstructions, comprising brick and concrete structures associated with the former gasworks structures, were encountered and some borehole and trial pit locations had to be moved to avoid these obstructions.

Rockhead was encountered at approximately +0.5m OD in BH2, 0.55m OD in BH34, +1.03m OD in BH40 and +1.43m OD in BH41, generally shallower than those further to the north west in the suspected deepest part of the quarry (ref. also Figure 3).

Hydrocarbon contamination was noted with some of the Made Ground materials in BH41. Spent oxide contamination was noted in places also, mainly in TP3 (underneath former purifier bins). Groundwater was encountered in BH41 at +3.83m OD and at +1.9m OD in BH2.

The south western area of the quarry was investigated by BH's 8 and 43, and TP's 13, 33, 39, 54, 48 and 59.

In general, the trial pits and boreholes encountered more granular Made Ground at this end of the former quarry.

Rockhead was encountered at +5.54m OD in BH8 and +4.54m OD in BH43, which is markedly shallower than the other parts of the former quarry.

Borehole (BH42) was excavated inside former gasholder No.3 which lies within this area of quarry. It found mainly cohesive Made Ground with very heavy visual and olfactory tar contamination, to a depth of +2.78m OD where the suspected base of the tank was encountered.

For inspection purposes only.
Consent of copyright owner required for any other use.

Leachability testing showed some exceedences relative to the screening and RTV values, sulphates, chromium and benzene being of particular note .

3.2.2 *Site Perimeter – West and North*

Four pairs of boreholes comprising 1 cable percussion and 7 rotary holes were carried out along the north east and north west boundaries of the site. These were designed principally to enable the groundwater quality close to the site boundary, but also to provide further information on the ground conditions and water levels.

Boreholes BH35/35A and BH36/36A proposed by the north-eastern site boundary had to be moved further into the site, away from where they were originally planned because of access restrictions (BH's 35/35A were to be on land owned by Limerick Harbour Commissioners) and the presence of electricity cables and the site access (BH 36/36A).

The boreholes are reviewed in an anticlockwise order from BH's 35/35A. The depths of the weathered zone and slightly more weathered zone have been assessed based on the logs, including inspection of core photographs, fracture spacings and RQD/SCR/TCR values.

In BH 35 and BH35A respectively, rockhead was encountered at +1.89m OD and +1.87m OD. The limestone was heavily fractured in the upper 0.35m of BH35 (core was lost or returned non-intact) with less fractured rock below (average fracture spacing of 400mm). BH35A indicated that the limestone shows close to medium fracture (average fracture spacings between 120-390m) to

EPA Export 29-05-2012:04:38:59

depth (down to at least –6.03m OD). Tar and hydrocarbon staining was noted in the core to the full depth of the holes. Results suggest a highly weathered zone of 0.4m depth below rockhead, followed by a less weathered zone extending to, say, 1.6m below rockhead.

In BH36 and BH36A, rockhead was encountered at +3.10m OD and +3.11m OD respectively. The limestone in BH36 had closely spaced fractures (average fracture spacing of 90mm) proven to +0.20m OD, with some clay infilling. In BH36A the limestone had closely spaced fractures (average spacing of 120mm) to +0.36m OD, and below this the fractures were closely to medium spaced (average fracture spacing of 200mm). No evidence of tar or hydrocarbon staining was recorded in these holes. Results suggest a highly weathered zone of 0.2m to 0.4m depth below rockhead, followed by a less weathered zone extending to, say, 2.9 below rockhead.

In BH37 and BH37A, rockhead was encountered at +2.55m OD and +2.45m OD respectively, this lying below a concrete slab in the case of BH37A. Fractures were closely spaced (average spacing 140mm) to +0.6m OD, and medium spaced below that (average spacing of 240mm). Evidence of tar and hydrocarbons was encountered in the fractures in both holes to their full depths. Approximately 0.2m of lost or non intact core was encountered in BH 37, which may correspond to the weathered zone, and a similar depth may have been removed from BH 37A prior to placing the concrete slab. The 'less weathered' zone may be considered to extend to, say, 1.3m to 1.0 m depth.

In BH38 and BH38A, rockhead was encountered at +2.19m OD and +3.89m OD respectively. Fractures in BH38 varied from close to medium spaced (average spacing between 120-230mm) to a proven depth of –0.81m OD. Fractures in BH38A were closely spaced to the proven depth of –5.71m OD (fracture spacing varying from 60 to 100mm). Hydrocarbon contamination was noted only in BH38A, in the upper section, in the fractures between +3.89m OD and +1.34m OD. BH 38 had a weathered/less weathered zone to at least 1.65m depth below rockhead, whilst in BH38A, the rock appeared weathered over the full depth cored, i.e. to 9.6m below rockhead, with the RQD not exceeding 59% and with many weathered bands and areas of clay fill recorded on the log.

Consent of copyright owner required for any other use. For inspection purposes only.

Overall, the results would suggest a typical weathered zone approximately 1.5m thick, but varying greatly between boreholes from 0.4m to greater than 9.6m.

Other boreholes from previous investigations excavated close to the boundaries include BH's 3, 10, 31 and 32. Rockhead was encountered at approximately +2.9m OD in BH3. In BH10, a deep sand deposit contaminated with tars was encountered to +0.59m OD, with cobbles and boulders in a clay matrix contaminated with tars below to -0.47m OD where limestone was encountered.

BH31 encountered rockhead at +3.35m OD, whilst in BH32 rockhead was encountered at +3.22m OD.

3.2.3 Rock Outcrop – South East Corner

The pile of limestone visible on the southern boundary of the site was investigated with a trial pit (TT52). This showed the pile to comprise soft clay, which included many large boulders of limestone. No indication of an outcrop of limestone above the general surrounding ground level was encountered.

EPA Export 29-05-2012:04:38:59

3.2.4 *Limestone Wall*

A total of five inspection pits were excavated adjacent to the old limestone wall that surrounds the area of the former gasholder No.2 base area. The position of these trial pits is shown on Figure 3.

IP01 and IP02 was excavated at the base of the limestone wall along the western boundary with Dock Road. In both of these positions, shallow obstructions comprising former buildings foundations and other brick and concrete structures restricted the depth of excavation as did the presence of live gas services nearby.

IP03 and IP05 were excavated on the north eastern side of the wall bounding the former gasholder No.2. IP03 encountered loose granular made ground comprising very mixed fill with domestic refuse, metal, wood, concrete, Limestone, blocks, glass and pottery. A concrete pipe was encountered at 1.35m depth, running south east to north west which restricted further excavation. No natural materials were encountered to the excavated depth of 1.65m.

In IP05 loose brick rubble fill was encountered to the excavated depth of 1.4m. Two large diameter south east to north west running pipes at 0.4m depth severely restricted the depth of excavation. Rock was possibly present at the base and would provide the foundation to the wall, but water and the limited space available made it difficult to confirm this.

Inspection pit IP04 was excavated by the south eastern boundary of the wall adjacent to the former purifier concrete base. This hole encountered granular made ground heavily contaminated with tar, plus a steel pipe to a depth of 0.85m, where limestone was encountered, which appears to provide the foundation to the wall.

Consent of copyright owner required for any other use.
For inspection purposes only.

3.2.5 *Drain encountered during main drainage works*

Shallow excavations were carried out between the recorded position of the drain found outside the site, adjacent to former gasholder No.1 and locations within the site, where it was thought it might run. The drain was recorded as being of concrete and of 600mm diameter at a depth of 1.85m and blocked with tar. No excavation was possible close to the site boundary because of live gas mains and physical obstructions. In TT104, a pipe was encountered which was thought could be the drain, being of similar type ands with tar within it, although its diameter could not be confirmed.

3.2.6 *Chemical Ground Conditions*

The soil chemical results have been initially compared against the generic guidelines used in the 2001 ground investigation (Report No. 25837/OR/04B). These levels were a combination of the Dutch Guidelines Intervention Values (1999) and, where no Dutch Guideline level exists, against the UK ICRCL Threshold Trigger Levels. It is noted that the ICRCL values were officially withdrawn by DEFRA in December 2002 and are no longer applicable in the UK, being replaced by the 'Contaminated Land Exposure Assessment' (CLEA) Model.

The table below indicates the elevated values above these generic guidelines. Samples were taken from across the quarry area including within the former gasholder No. 3 base (BH42).

EPA Export 29-05-2012:04:38:59

Table –Contamination Levels in Soil

Determinand	Range (mg/kg unless stated)	Trigger Level (mg/kg unless stated)	Exceedence Location (value in brackets in mg/kg unless stated)
Loss on Ignition	1-39 (%)	25 (%)	IP04 0.4m(37%), TT54 0.5m(39%)
Total Phenols	<0.01-1152.7	45	IP04 0.4m(1152.7), BH42 2.0m(59.39), BH42 3.0m(129.24), BH42 5.0m(76.12),
Total (10 Dutch PAH determinants)	0.83-11691.69	40	IP04 0.4m(11691.69), IP36 1.2m(62.2), IP39 2.0m(107.6), TP53 1.0m(706.42), TP55 0.6m(388.93), TP55 2.0m(10130.66), TP57 1.0m(59.3), TP58 1.0m(75.56), TP59 1.3m(325.3), TT54 04m(1315.69), TT54E 0.6m(4170.57),TT54 4.2m(507.67), TT56 1.75m(65.69), TT100 1.4m(383.35), TT100 2.2m(184.8), TT100(DUP) 2.2m(140.71), TT101 0.8m(99.99), TT101 2.7m(405.66), BH35 GL 1.2m(271.39), BH39D 4.5m(130.82), BH39D 6.5m(59.48), BH41C 3.5m(66.42), BH42 2.0m(7315.1), BH42 3.0m(5606.05), BH42 5.0m(836.3), BH43 0.6m(543.29), BH43 2.05m(834.12)
Total Cyanide	2.5 2043.4	70	TP53 1.0m(124.3), TP55 0.6m(283.3), TP55 2.0m(2043.4), TP58 1.0m(107.5), TP58 2.0m(116.7), TP59 1.3m(117.6), TT54 0.5m(1154), TT54E 0.6m(79.1), TT54 4.2m(402.5), TT100 1.4m(980.3), TT100 2.2m(83.4), TT100 (DUP) 2.2m(123.4), BH35 3.4m(136.5), BH35 GL 1.2m(101.8), BH40 4.0m(102.9), BH43 2.05m(99.8)
Elemental Sulphur	50- 55546	5000	TT54 0.5m(55546)
Arsenic	1-116	55	TP59 1.3m(85). TT54E 0.6m(116). TT54 4.2m(102), BH42 2.0m(93)
Lead	1-1969	530	IP36 1.2m(1094), IP39 2.0m(1513), TP55 0.6m(1632), TP57 1.0m(905), TP57 4.0m(1101), TP58 2.0m(1522), TT52 EARTH (1747), TT54E 0.6m(1969), TT54 4.2m(1592), TT56 1.75m(674), BH35 GL 1.2m(797), BH43 0.6m(2105)
Copper	5-644	190	IP39 2.0m(217), TP55 0.6m(644), TP57 4.0m(217), TT54E 0.6m(387), BH35 GL 1.2m(270)

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

Determinand	Range (mg/kg unless stated)	Trigger Level (mg/kg unless stated)	Exceedence Location (value in brackets in mg/kg unless stated)
Nickel	4-254	210	TP59 1.3m(213), TT54E 0.6m(232), TT56 0.3m(254), TT56 1.75m(242)
Zinc	11-1637	720	IP36 1.2m(728), TP55 2.0m(1637), TP55 2.0m(840), TP57 1.0m(1017), TP57 4.0m(1275), TP58 2.0m(1008), TT54E 0.6m(1504), TT56 1.75m(1116), BH42 2.0m(1237)
Benzene	0.001-111.65	1	IP04 0.4m(21.49), TP55 2.0m(111.65), TT54 4.2m(1.31), BH42 2.0m(90.12), BH42 3.0m(93.28)
Toluene	0.001-401.89	130	TP55 0.6m(401.89)
Ethylbenzene	0.001-89.47	58	TP55 0.6m(89.47)
Xylene	0.001 710.82	25	IP04 0.4m(190.52), TP55 0.6m(710.82), BH42 2.0m(188.2), BH42 3.0m(230.48)
Sulphate	28-7915	2000	TP53 1.0m(4930), TP55 0.6m(5100), TP59 1.3m(6595), TT54 0.5m(7915), TT56 0.3m(5395), TT56 1.75m(7440), TT101 0.8m(7795), TT101 2.7m(3685), BH43 2.05m(5070)

For inspection purposes only.
Consent of copyright owner required for any other use.

Contamination was found generally within the quarry, with PAH and total Cyanide relatively widespread, above the Dutch Intervention levels of 40mg/kg and 70mg/kg respectively. Heavy metals, particularly lead, were also encountered in places, as were sulphates.

Particular areas of contamination identified by this investigation included TT54 with extensive contamination from 0.5m to 4.2m depth (PAH, TCN, Pb, Be, etc), BH42 at 2-3m depth (Phenols, PAH, BTEX, Zn), TP55 to 2m (PAH, TCN, BTEX, Pb, Cu, Zn), and IP04 to 0.5m (PAH, phenols, BTEX).

The soil chemical results have also been compared against the Remedial Target Values (RTV's) derived in the Quantitative Risk Assessment (QRA) (Report No. 25837/R/08/A). These values will form the basis of the remediation planned for the site and the RTV's will define the materials that require removal and treatment. The table below indicates the elevated soil contamination values above the relevant RTV's.

Determinand (mg/kg unless stated)	Range (mg/kg unless stated)	QRA RTV (mg/kg unless stated)	Exceedence Location (value in brackets in mg/kg unless stated)
Arsenic	1-116	20	IP36 1.2m(48), IP39 2.0m(461), TP57 1.0m(41), TP57 4.0m(49), TP58 2.0m(38), TP59 1.3m(85), TT52 Earth(45), TT54E 0.6m(116), TT54 4.2m(102), TT56 1.75m(54), BH35 GL-1.2m(28), BH42 2.0m(93)

EPA Export 29-05-2012:04:38:59

Determinand (mg/kg unless stated)	Range (mg/kg unless stated)	QRA RTV (mg/kg unless stated)	Exceedence Location (value in brackets in mg/kg unless stated)
Chromium	<1-169	130	IP39 2.0m(169), TP57 4.0m(136), TT56 0.3m(146)
Copper	5-644	17	IP36 1.2m(109), IP39 2.0m(217), Tp53 1.0m(150), TP53 4.5m(32), TP55 0.6m(644), TP55 2.0m(28), TP57 1.0m(102), TP58 2.0m(128), TP59 1.3m(70), TT52 Earth(136), TT54 0.5m(126), TT54E 0.6m(387), TT54 4.2m(178), TT56 0.3m(178), TT56 1.75m(152), TT101 0.8m(21), BH35 GL-1.2m(270), BH35 3.4m(32), BH39D 4.5m(28), BH40 4.0m(47), BH42 2.0m(138), BH43 3.0m(18), BH43 0.6m(78), BH43 2.05m(34).
Nickel	4-254	75	IP39 2.0m(97), TP53 1.0m(117), TP53 4.5m(78), TP55 0.6m(111), TP57 1.0m(77), TP57 4.0m(90), TP58 2.0m(83), TP59 1.3m(213), TT52 Earth(107), TT54 0.5m(80), TT54E 0.6m(232), TT54 4.2m(153), TT56 0.3m(254), TT56 1.75m(242), TT101 3.8m(80), BH42 2.0m(158)
Zinc	11-1637	720	IP36 1.2m(728), IP39 2.0m(1271), TP55 0.6m(1637), TP55 2.0m(840), TP57 1.0m(1017), TP57 4.0m(1275), TP58 2.0m(1008), TT54E 0.6m(1504), TT56 1.75m(1116), BH42 2.0m(1237),
Benzene	0.001-111.65	0.00224	IP04 0.4m(21.485), IP39 2.0m(0.954), TP53 4.5m(0.011), TP55 0.6m(0.008), TP55 2.0m(111.645), TT54 0.5m(0.005), TT54E 0.6m(0.012), TT54 4.2m(1.312), TT56 1.75m(0.022), TT100 1.4m(0.193), TT100 2.20m(0.897), TT100 Dup 2.20m(0.633), TT101 0.8m(0.021), TT101 3.8m(0.163), BH35 3.4m(0.048) BH39D 4.5m(0.016), BH40 4.0m(0.003), BH40 5.0m(0.052), BH41C 3.5m(0.537), BH41C 5.5m(0.061), BH42 2.0m(90.124), BH42 3.0m(93.281), BH42 5.0m(0.11), BH43 4.2m(0.005)
Xylene	0.001 710.82	125	IP04 0.4m(190.52), TP55 2.0m(710.823), BH42 2.0m(188.196), BH42 3.0m(230.479)
Chloride	20-615	68.4	IP04 0.4m(120), IP39 2.0m(80), TP55 0.6m(170), TP55 2.0m(130), TP57 4.0m(85), TP58 2.0m(545), TP59 1.3m(475), TT52 Earth(270), TT54 0.5m(615), TT54E 0.6m(115), TT54 4.2m(310), TT100 2.2m(115), TT100 Dup 2.2m(255), TT101 0.8m(100), TP101 2.7m(300), BH35 3.4m(585) BH35 GL-1.2m(220), BH39D 4.5m(95), BH39D 6.5m(95), BH40 4.0m(610), BH40 5.0m(95), BH41C 3.5m(280), BH41C

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

Determinand (mg/kg unless stated)	Range (mg/kg unless stated)	QRA RTV (mg/kg unless stated)	Exceedence Location (value in brackets in mg/kg unless stated)
			5.5m(285), BH42 2.0m(140), BH42 3.0m(170), BH42 5.0m(150)
Sulphate	28-7915	67.8	IP04 0.4m(255), IP36 1.2m(230), IP39 2.0m(115), TP53 1.0m(4930), TP53 4.5m(145), TP55 0.6m(5100), TP55 2.0m(850), TP57 1.0m(935), TP58 1.0m(1190) TP58 2.0m(1740), TP59 1.3m(6595), TT54 0.5m(7915), TT54E 0.6m(370), TT54 4.2m(1530), TT56 0.3m(5395), TT56 1.75m(7440), TT100 1.4m(665) TT100 2.2m(550), TT100 Dup 2.2m(305), TT101 0.8m(7795), TT101 2.7m(3685), BH35 3.4(280), BH35 GL-1.2m(455), BH39D 4.5m(1435), BH39D 6.5m(1420) BH40 4.0m(1380), BH40 5.0m(380), BH41C 3.5m(430), BH41C 5.5m(425), BH42 2.0m(1100), BH42 3.0m(635), BH42 5.0m(275), BH43 0.6m(1330), BH43 2.05m(5070), BH43 4.2m(520)..

Consent of copyright owner required for any other use.
For inspection purposes only.

The above comparison of results against the preliminary QRA RTV values for human health shows arsenic, copper, zinc, benzene, chloride and sulphates of general widespread concern. The major contamination encountered indicated by this comparison was total PAH (10 Dutch determinands) which was encountered in the made ground across the quarry area and also adjacent to the former gasholder No.1 base in the northern corner of the site.

3.3 Groundwater Conditions

3.3.1 Groundwater Levels

Groundwater levels were monitored on three occasions during this investigation. The results are summarised in Appendix D.

The results suggest a hydraulic gradient generally towards the river, i.e. to the north west, at a gradient of about 1:25, falling typically from 5.1m OD in BH 43 by the eastern edge of the quarry to 4.4m OD in BH 39 by its western edge and 2.6m OD in BH 31 and 38 towards the western site boundary.

3.3.2 Groundwater Quality

On the monitoring visit carried out on 11th September the presence of light and dense, non-aqueous liquid (LNAPL & DNAPL) was recorded in all boreholes with samples taken of the DNAPL, where possible. LNAPL was found in boreholes, 7, 37A and 38A typically 1mm thick on top of the water.

EPA Export 29-05-2012:04:38:59

DNAPL was encountered in six boreholes, BH 7(2m thick), BH33 (0.03m thick), BH37A (0.01m thick), BH 38 (0.031m thick), BH38A (0.54m thick) and BH42 (0.184m thick).

Groundwater chemical sample results were initially compared against the generic guidelines used in the 2001 ground investigation (Report No. 25837/OR/04B). These levels were a combination of the Dutch Guidelines Intervention Levels (1999) and, where no Dutch Guideline level exists, against the Maximum Allowable Concentrations for drinking water in the UK Water Supply (Water Quality) Regulations 1989.

The series of tables following indicates the elevated values above these generic guidelines split into three areas i.e. within the quarry, within the tank structures on-site and along the site boundary.

BTEXs [benzene, toluene, Ethylbenzene and xylene] were analysed by GC/MS scan for all samples tested and these are the values compared in the following Tables. Where water samples were also scheduled for the analysis of Total Petroleum Hydrocarbons to the CWG methodology, alternative values are also reported which relate to a GC/FID scan. Some variation between the two methodologies are apparent in the results as might be expected, but they do provide a check on gross errors, as evidenced in BH 38A.

Sediment/DNAPL from two boreholes, BH7 and BH38A, sampled on the last monitoring visit and analysed as soil. Comments on the results are included below.

Consent of copyright owner required for any other use.
For inspection purposes only.

Table – Contamination Levels in Groundwater in the Quarry

Determinand	Range (mg/l unless stated)	Trigger Level (mg/l unless stated)	Exceedence Location (value in brackets in mg/l)		
			During Siteworks	1st Monitoring Visit	2nd Monitoring Visit
pH	6.9-11.75 (pH units)	<5.5->9.5 (pH units)			BH40(11.75)
Conductivity	1218-2620 µS/cm	1500 µS/cm	TP58 3m(1905), TT54 3.8m(1701), TT101 3.5m(1784)	BH39(2620), BH40(1522), BH43(1744)	BH39(1872), BH40(2180),
Cresols	<0.01-35.07	0.2	TP55 3.2m(17.89)	BH39(35.07), BH41C(1.08),	BH39(4.63), BH41C(1.65), BH43(2.01)
Phenol	<0.01-13.93	2	TP55 3.2m(4.79)	BH39(13.93),	BH39(2.38)
10 Dutch PAH	0.0013-8.6901	0.08175	TP55 3.2m(8.6901), TP58 3m(1.0506), TP59 3.4m(0.3458)	BH39(0.1478), BH41C(0.5317)	BH39(0.9744), BH41C(3.3259)
Cyanide	<0.5-3.3	3		BH41C(3.3)	
Sulphate	56-1197	250	TP55 3.2m(962), TP58 3m(1142),	BH39(1197), BH41C(468), BH43(825)	BH40(453), BH41C(718), BH43(770)

EPA Export 29-05-2012:04:38:59

Determinand	Range (mg/l unless stated)	Trigger Level (mg/l unless stated)	Exceedence Location (value in brackets in mg/l)		
			During Siteworks	1st Monitoring Visit	2nd Monitoring Visit
			TP59 3.4m(559), TT54 3.8m(789), TT101 3.5m(728)		
Total Ammonium	0.7-88	3	TP54 3.2m(7.5), TT54 3.8m(6.3), TT101 3.5m(20.4)	BH39(29), BH40(88), BH41C(16.2)	BH39(13), BH40(79.8), BH41C(14.1)
Benzene	<0.001-5.347	0.03	TP55 3.2m(5.347), TP59 3.4m(0.099), TT101 3.5m(0.313)	BH39(1.608), BH41C(1.434),	BH39(0.612), BH41C(1.329)
Toluene	<0.001-8.824	1	TP55 3.2m(8.824)	BH39(1.5), BH41C(1.56)	BH41C(1.651)
Ethylbenzene	<0.001-0.884	0.15	TP55 3.2m(0.884)	BH39(0.383), BH39(0.166), BH41C(0.731)	BH41C(0.787)
Xylene	<0.001-7.569	0.07	TP55 3.2m(7.469), TP59 3.4m(0.095), TT101 3.5m(0.283)	BH39(2.534), BH41C(5.654), BH43(0.375)	BH39(0.815), BH41C(6.551)
Iron	0.119-4.128	0.2	TP55 3.2m(3.72), TP58 3m(0.746), TP59 3.4m(4.128), TT54 3.8m(0.469), TT101 3.5m(3.69)	BH39(0.228), BH41C(1.36), BH43(0.296)	BH39(0.277), BH41C(0.943), BH43(0.434)
TPH	0.027-72.832	0.15	TP55 3.2m (72.832), TP59 3.4m(1.884)	BH39(0.34), BH41C(0.379)	BH39(7.27), BH40(1.532), BH41C(20.442)

Consent of copyright owner required for any other use. For inspection purposes only.

This table indicates that, in general, the major contaminants encountered in the groundwater in the quarry area comprised PAH's, BTEX, sulphates, ammonium, iron and TPH.

EPA Export 29-05-2012:04:38:59

Table –Contamination Levels in Groundwater in former Gasholder No.3 and pre-1872 tank base

Determinand	Range (mg/l unless stated)	Trigger Level (mg/l unless stated)	Exceedence Location (value in brackets in mg/l)	
			1st monitoring Visit	2nd monitoring Visit
pH	8.59-9.71 (pH units)	<5.5->9.5 (pH units)		BH42(9.71)
Conductivity	3290-4940 µS/cm	1500 µS/cm	BH7(3360), BH42(4860)	BH7(3290), BH42(4940)
Cresols	1.2-522.84	0.2	BH7(2.66), BH42(3.07),	BH7(1.2), BH42(522.84)
Phenol	0.32-382.18	2	BH42(2.71),	BH42(382.18)
10 Dutch PAH	0.0643-0.9643	0.08175	BH7(0.9643),	BH7(0.6183), BH42(0.1726)
Cyanide	11.2-21.7	3	BH7(21.7), BH42(17.5),	BH7(15.5), BH42(11.2)
Sulphate	1.18-1563	250	BH7(1444),	BH7(1563), BH42(1284)
Total Ammonium	18-282.8	3	BH7(18), BH42(256),	BH7(20.5), BH42(282.8)
Benzene	2.394-10.546	0.03	BH7(4.829), BH42(8.516),	BH7(2.394), BH42(10.546)
Toluene	1.262-4.75	1	BH7(2.875), BH42(4.015),	BH7(1.262), BH42(4.75)
Ethylbenzene	0.147-0.319	0.15	BH7(0.319), BH42(0.296),	BH42(0.289)
Xylene	1.538-2.939	0.07	BH7(2.939), BH42(2.405),	BH7(1.538), BH42(2.454)
Iron	4.855-8.32	0.2	BH7(4.855), BH42(6.112),	BH7(5.957), BH42(8.32)
Arsenic	0.02-0.127	0.06	BH42(0.067),	BH42(0.127)
Nickel	0.019-0.081	0.075	BH42(0.081)	
Selenium	0.005-0.055	0.01	BH42(0.046),	BH42(0.055)
TPH	0.239-36.958	0.15	BH7(0.239), BH42(21.737),	BH7(10.456), BH42(36.958)

Consent of copyright owner required for any other use. For inspection purposes only.

This table indicates that, in general, the major contaminants encountered in the groundwater within the tanks comprised PAH's, BTEX, ammonium, cyanide, iron and TPH. Some traces of metals, namely arsenic, nickel and selenium, were encountered in the former gasholder No. 3 tank base (BH42).

A sample of the sediment/DNAPL in the base of BH7 was taken on the second monitoring visit. The results of its analysis are included in Appendix C, at the end of the Section on water results, although they are analysed as soil. Results show the samples to be high in BTEX and PAH.

Table –Contamination Levels in Groundwater along the Site Boundary

EPA Export 29-05-2012:04:38:59

Determinand	Range (mg/l unless stated)	Trigger Level (mg/l unless stated)	Exceedance Location (value in brackets in mg/l)		
			During Siteworks	1st monitoring Visit	2nd monitoring Visit
pH	7.02-9.59 (pH units)	<5.5->9.5 (pH units)			BH38(9.59)
Conductivity	405-4020 µS/cm	1500 µS/cm	BH38A(3780)	BH35(1675), BH35A(1540), BH38(4020), BH38A(2020),	BH35(1615), BH35A(1725), BH38(4020), BH38A(2540)
Cresols	<0.01-200.17	0.2	BH38(1.92), BH38(139.27)	BH33(15.88), BH35(9.78), BH37(0.71), BH37A(14.06), BH38(128.17), BH38A(54.2)	BH32(13.01), BH37(37.66), BH37A(11.56), BH38(200.17), BH38A(98.5)
Phenol	<0.01-142.09	2	BH38A(142.09)	BH33(10.41), BH35(3.55) BH37A(20.85) BH38(136.04) BH38A(43.11)	BH32(9.35), BH37(48.76), BH37A(6), BH38(139.6), BH38A(54.9)
10 Dutch PAH	0.0005-8.6721	0.08175	BH32(0.0947), BH33(0.1845) BH35(0.1414) BH38(5.6725), BH38A(0.6742)	BH33(0.3254) BH35(0.1509), BH37(0.5392), BH38(0.1591), BH38A(0.2483)	BH33(0.3683), BH35(6.9426), BH37(0.1192), BH37A(3.3652), BH38(0.4653), BH38A(8.6721)
Sulphate	42-997	250	BH35(580), BH36(292), BH36A(400), BH38(463), BH38A(967)	BH31(252), BH35(575), BH35A(539), BH36(271), BH38A(544)	BH35(573), BH35A(657), BH36(261), BH36A(380), BH38(997), BH38A(716)
Total Ammonium	0.2-568.6	3	BH33(25.1), BH35(18.2), BH36A(8.5), BH38(48.8), BH38A(455.2)	BH33(47), BH35(21), BH35A(15.9), BH36(4.9), BH36A(9.5), BH37(26.4), BH37A(29.7), BH38(568.6), BH38A(64.9)	BH33(45.9), BH35(16.2), BH35A(18.2), BH36(6.1), BH36A(10.2), BH37(85.3), BH37A(24.9), BH38(514.2), BH38A(152.3)
Benzene	<0.001-969.958	0.03	BH33(8.244), BH38(10.853), BH38A(16.22)	BH33(7.4), BH35(0.917), BH35A(0.595), BH37(1.579), BH37A(2.425), BH38(6.366), BH38A(8.729)	BH32(10.664), BH33(7.912), BH35(0.504), BH35A(0.48), BH37(1.674), BH37A(4.637), BH38(12.05), BH38A(18.618*)

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

Determinand	Range (mg/l unless stated)	Trigger Level (mg/l unless stated)	Exceedance Location (value in brackets in mg/l)		
			During Siteworks	1st monitoring Visit	2nd monitoring Visit
Toluene	<0.001-1007.852	1	BH33(3.57), BH38(5.3), BH38A(5.412)	BH33(3.22), BH37A(1.574), BH38(1.641), BH38A(4.763)	BH32(6.11), BH33(3.145), BH37A(2.744), BH38(5.281), BH38A(116.12*)
Ethylbenzene	<0.001-175.504	0.15	BH33(0.255), BH38(0.324), BH38A(0.268)	BH35(0.222), BH38A(0.356)	BH32(0.408), BH37(0.351), BH37A(2.744), BH38(0.3), BH38A(1.163*)
Xylene	<0.001-1590.72	0.07	BH33(2.861), BH35(0.277), BH38(3.525), BH38A(3.261)	BH33(2.017), BH35(0.771), BH35A(0.171), BH37(0.132), BH37A(1.414)	BH32(3.903), BH33(1.917), BH35(0.302), BH35A(0.185), BH37(0.125), BH37A(2.171), BH38(3.393), BH38A(9.94*)
Iron	<0.005-1.47	0.2	BH35(0.204), BH36A(0.21), BH38(0.467), BH38A(1.268)	BH35(0.311), BH35A(0.522), BH38(1.372), BH38A(0.987)	BH32(0.413), BH33(0.555), BH35(0.332), BH35A(0.646), BH36(0.253), BH36A(0.397), BH38(1.74), BH38A(1.304)
Arsenic	0.003-0.093	0.06		BH38(0.093)	BH38(0.069)
Chromium	0.001-0.057	0.03	BH38A(0.042)	BH38(0.057)	BH38(0.048)
Selenium	<0.001-0.035	0.01	BH38A(0.035)	BH37(0.017), BH38(0.021), BH38A(0.013)	BH37A(0.019), BH38(0.025), BH38A(0.016)
TPH	0.014-61.075	0.15	BH32(0.627 BH33(1.329), BH35(0.666), BH36(1.986), BH38(2.436), BH38A(0.165)	BH35(1.6), BH37(0.541), BH37A (0.169), BH38(0.868), BH38A(45.642)	BH32(0.415), BH33(3.784), BH35(2.235), BH35A(0.768), BH36(0.186), BH36A(0.174), BH37(4.068), BH37A(13.899), BH38(36.551), BH38A(61.075)

* results based on GC/FID methodology, see comment in paragraph 2 below

This table indicates that, in general, the major contaminants encountered in the groundwater along the site boundary comprised PAH's, BTEX, ammonium, iron and TPH. Some traces of

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

metals, namely arsenic, chromium and selenium, were encountered in the area of the former gasholder No. 2 tank base (BH's 37, 37A, 38 and 38A).

BH's 36/36A appear generally uncontaminated, with BH 35/35A slightly contaminated. Contamination levels are significant in BH 37/37A with concentrations in many instances over 10x the trigger level and up to 190x (eg benzene & cresol). In BH38A results from the last monitoring visit show unusually high BTEX levels by the GC/MS method which are incompatible with those from the GC/FID method. Inspection of the traces from the analyses and discussion with the Laboratory suggests that the sample may have got slightly mixed with either sheen on the water, or from disturbed sediment. In these circumstances the results from the GC/FID method have been included in the Table above, marked by *, in lieu of the GC/MS values for BTEX. {No amendments are made to PAH, TPH, ammonium or iron, although it is possible, that the PAH values, in particular, are also affected}.

A sample of the sediment/DNAPL in the base of BH38A was taken on the second monitoring visit. The results of its analysis are included in Appendix C, at the end of the Section on water results, although they are analysed as soil. Results show the samples to be high in BTEX and PAH and of a similar composition (but generally higher) than those in the adjacent BH 7

Comparison of the results between the quarry or the tanks and the boreholes towards the site boundaries show little or no evidence of a reduction in the level of contamination present in the groundwater at first inspection. It is possible that a more detailed comparison between likely sources and the boundary monitoring locations could show otherwise, but this appears unlikely, with comparison between BH 38 and the closest likely 'source' the pre1872 (tar) tank (BH 7) showing no evidence of reduction in levels but a possible increase in relation to benzene.

Consent of copyright owner required for any other use. For inspection purposes only.

The water chemical results have also been compared against the Remedial Target Values (RTV) derived in the preliminary Quantitative Risk Assessment (Report No.25837/R/08A) for the 'contaminants of concern' (CoC).

The following tables indicate values above the RTV's, related to the areas considered in the previous section, i.e. the quarry, within the tank structures and towards the site boundary.

Table –Contamination Levels in Groundwater in the Quarry

Determinand	Range (mg/l unless stated)	Trigger Level (mg/l unless stated)	Exceedence Location (value in brackets in mg/l)		
			During Siteworks	1st monitoring Visit	2nd monitoring Visit
Sulphate	56-1197	261	TP55 3.2m(962), TP58 3m(1142), TP59 3.4m(559), TT54 3.8m(789), TT101 3.5m(728)	BH39(1197), BH41C(468), BH43(825)	BH40(453), BH41C(718), BH43(770)
Sulphide	<0.05	0.000261	All values exceed RTV as detection limit is above RTV		
Chloride	26-617	261		BH40(617)	BH39(495),
Benzene	<0.001-1.608 & 5.347	0.0152	TP55 3.2m(5.347), TP59 3.4m(0.099), TT101	BH39(1.608), BH41C(1.434)	BH39(0.612), BH41C(1.329)

EPA Export 29-05-2012:04:38:59

			3.5m(0.313)		
Copper	<0.001-0.033	0.0314		BH40(0.033)	

This table indicates that, in general, the major contaminants encountered in the groundwater above the derived RTV's for the CoC's in the quarry area comprised sulphate, sulphide, chloride and benzene.

Table –Contamination Levels in Groundwater in former gasholder No.3 and pre-1872 tank base

Determinand	Range (mg/l)	Trigger Level (mg/l)	Exceedence Location (value in brackets in mg/l)	
			1st monitoring Visit	2nd monitoring Visit
Sulphate	1.18-1563	261	BH7(1444)	BH7(1563), BH42(1284)
Sulphide	<0.05-1.99	0.000261	BH7(1.97), BH42(0.09)	BH7(1.99), BH42(<0.05)
Chloride	461-794	261	BH7(640), BH42(664)	BH7(461), BH42(794)
Benzene	2.394-10.546	0.0152	BH7(4.829), BH42(8.516)	BH7(2.394), BH42(10.546)
Arsenic	0.02-0.127	0.0261	BH42(0.067)	BH7(0.03), BH42(0.127)
Nickel	0.019-0.081	0.0523	BH42(0.081)	BH42(0.068)
Zinc	0.012-0.121	0.105		BH7(0.121)

Consent of copyright owner required for any other use.
For inspection purposes only.

The above table indicates that the major contaminants encountered in the groundwater above the derived RTV's for the CoC's within the tanks comprised sulphate, sulphide, chloride and benzene. Some traces of metals, namely arsenic, nickel and zinc were also encountered.

Table –Contamination Levels in Groundwater along the Site Boundary

Determinand	Range (mg/l)	Trigger Level (mg/l)	Exceedence Location (value in brackets in mg/l)		
			During Siteworks	1st monitoring Visit	2nd monitoring Visit
Sulphate	42-997	261	BH35(580), BH36(292), BH36A(400), BH38(463), BH38A(967)	BH35(575), BH35A(539), BH36(271), BH36A (410), BH38A(544)	BH35(573), BH35A(657), BH36A(380), BH38(997), BH38A(716)
Sulphide	<0.05	0.000261	All values exceed RTV as detection limit is above RTV		
Chloride	20-983	261	BH38(299),	BH38(983),	BH37A(365),

EPA Export 29-05-2012:04:38:59

Determinand	Range (mg/l)	Trigger Level (mg/l)	Exceedence Location (value in brackets in mg/l)		
			During Siteworks	1st monitoring Visit	2nd monitoring Visit
			BH38A(628)	BH38A(346)	BH38A(662)
Total Ammonium	0.2-568.6	456			BH38(568.6), BH38(514.2)
Benzene	<0.001-16.22 & 969.958	0.0152	BH33(8.244), BH35(0.017), BH38(10.853), BH38A(16.221)	BH33(7.4), BH35(0.917), BH35A(0.595), BH37(1.579), BH37A (2.425), BH38(6.366), BH38A(8.729)	BH32(10.664), BH33(7.912), BH35(0.504), BH35A(0.48), BH37(1.674), BH37A(4.637), BH38(12.05), BH38A(969.958)
Arsenic	0.003-0.093	0.0261	BH38A(0.032)	BH38(0.093)	BH38(0.069)
Chromium	0.001-0.057	0.00314	BH38A(0.042)	BH38(0.057)	BH38(0.048)
Copper	<0.001-0.051	0.0314			BH38A(0.051)

Consent of copyright owner required for any other use. For inspection purposes only.

This table indicates that, in general, the major contaminants encountered in the groundwater above the derived RTV's for the CoC's along the site boundary comprised sulphate, sulphide, chloride and benzene. Some traces of metals, namely arsenic, chromium and copper, as well as ammonium were encountered in the area of the former gasholder No. 2 tank base (BH's 38 and 38A).

The results show sulphates and benzene to be the main contaminants which are likely to be of major concern within the groundwater, both within the site and towards the site boundaries.

3.4 Other parameters

3.4.1 Fraction of Organic Carbon.

Twelve Fraction of Organic Carbon tests were carried out, eight on samples of the superficial and four on samples of rock strata to provide data for any groundwater risk assessments that may be carried out. Results are included within Appendix E. Results in the made ground ranged between 0.003 to 0.062, with an average of 0.021 and no visible variation between granular and cohesive deposits. Results on the rock vary between 0.001 and 0.023 with an average of 0.007.

3.4.2 Point load tests

Nine Point Load tests were carried out on six samples of limestone from BH 36 and three from BH 38. The strength varied, with Is (50) varying between 4.2 and 12 Mpa, but averaged at 9 Mpa. This corresponds to a uniaxial compressive strength of around 200 Mpa, equivalent to a

EPA Export 29-05-2012:04:38:59

moderately weak rock, which is slightly lower than the general borehole descriptions of a moderately strong rock.

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:38:59

SECTION 4: CONCLUSIONS

1. A further site investigation has been carried out comprising 4 pairs of boreholes for groundwater monitoring, close to the site boundaries, together with ten trial pits and five percussion boreholes to investigate in more detail chemical and ground conditions within the quarry area.

2. Groundwater monitoring has been carried out both within the pairs of boreholes close to the site boundaries and also from boreholes within the quarry area and elsewhere within the site on up to three occasions.

3. The Made Ground within the quarry varies in consistency in both plan and elevation with no visible evidence of stratification. Additional rock levels have been determined within the quarry to facilitate in determining the volume of material within it.

4. Boreholes designed to be located on the site boundary were not always able to be located as desired, due to services and access restrictions. Hence results from such boreholes may more closely reflect on-site conditions than desired. Results from these boreholes suggest a small depth of weathering in most cases, generally less than 1.5m, although BH38A was highly weathered to its full depth, of 9.6m into rock.

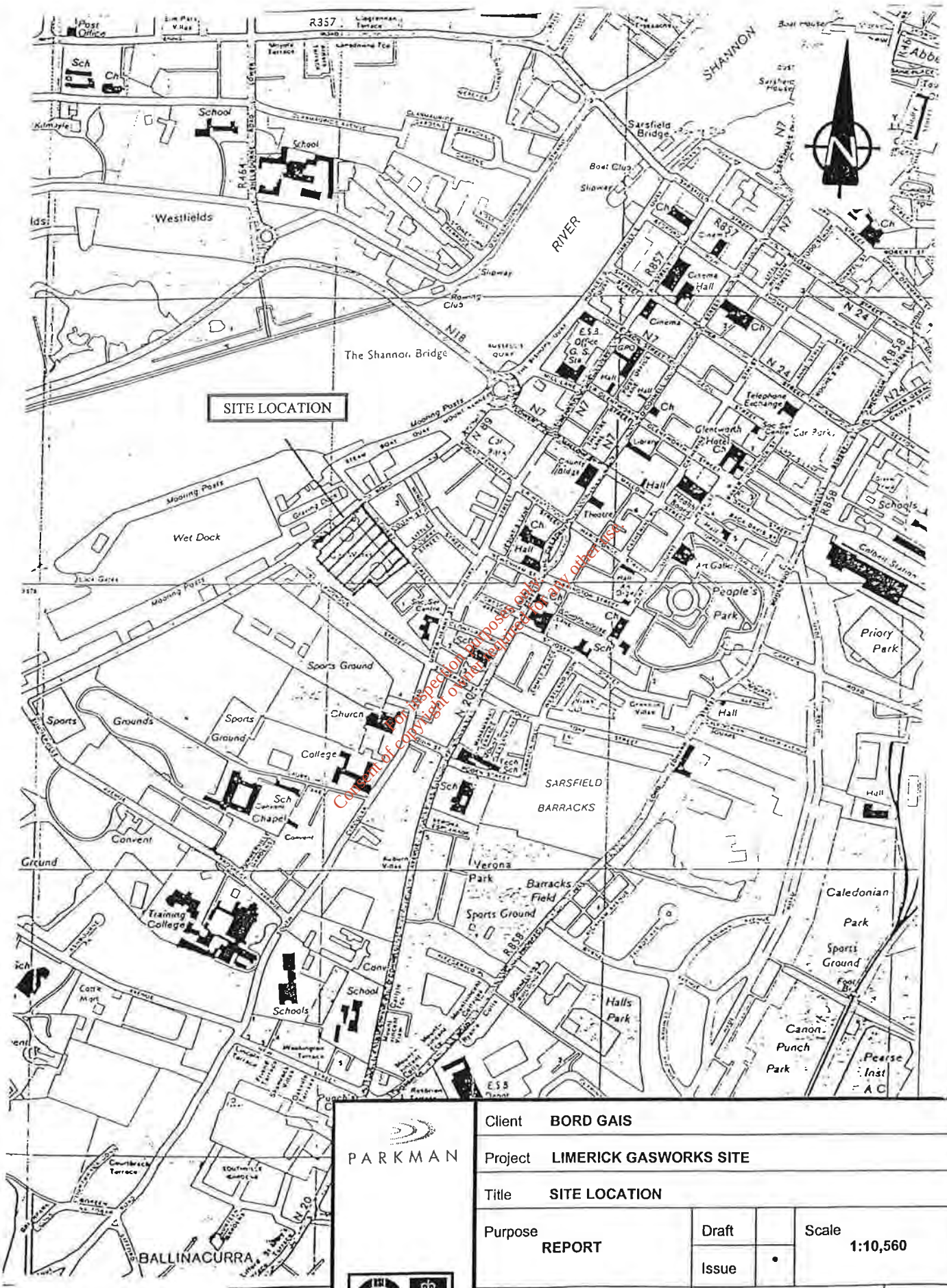
5. Within the quarry area, PAH and cyanide was relatively widespread. Heavy metals, (particularly lead) plus sulphates were also encountered in various locations. Comparison of results with the preliminary QRA showed benzene to be of particular concern, whilst copper, zinc, arsenic, chloride and sulphates regularly exceeded the proposed RTV values.

6. Groundwater monitoring suggested a hydraulic gradient of around 1 in 25 towards the north west, i.e. towards Dock Road and the Shannon.

7. Groundwater sampling and chemical analysis shows little or no evidence of a reduction in contamination levels between the main body of the site and monitoring boreholes towards the Dock Road site boundary.

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:38:59

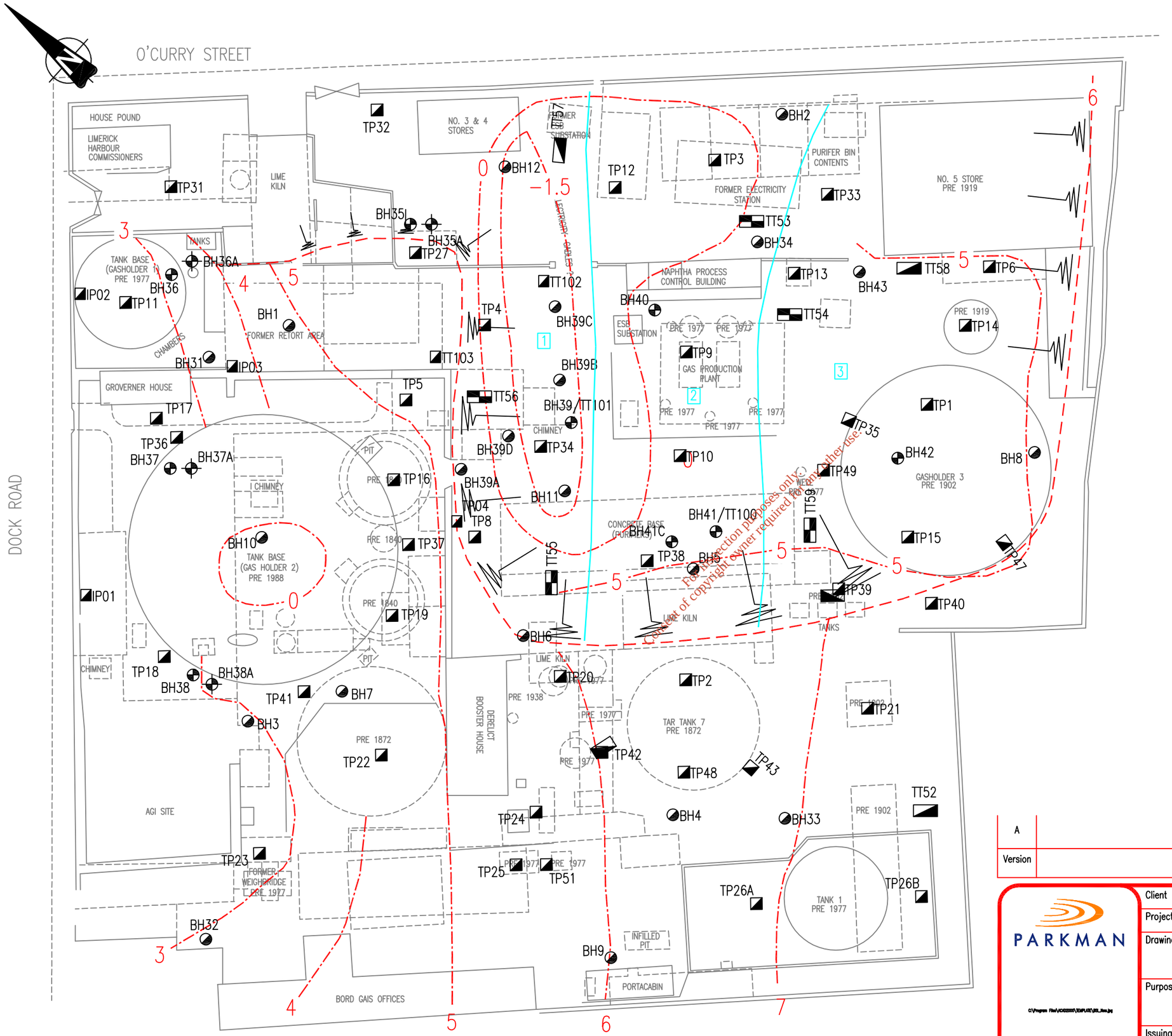


For inspection purposes only.
Consent of copyright owner required for any other use.

PARKMAN

Client	**BORD GAIS**		
Project	**LIMERICK GASWORKS SITE**		
Title	**SITE LOCATION**		
Purpose **REPORT**	Draft		Scale **1:10,560**
	Issue	•	
Issuing Office **CHESTER**	Drawing number **FIGURE 1**		Version **A**
Telephone **0151 3565555**			

EPA Export 29-05-2012:04:38:59



Key

- Approximate Location of Former Structure
- Trial Pits 1991, 1995, 2001 SI
- Boreholes 1991, 1995, 2001 SI
- Approximate Edge of former Quarry
- Estimated Rock Contours m(OD)
- Cable Percussion Borehole, 2003 S.I.
- Rotary Borehole, 2003 S.I.
- Trial Trench TT52–59, 2003 S.I.
- Quarry Zones 1 / 2

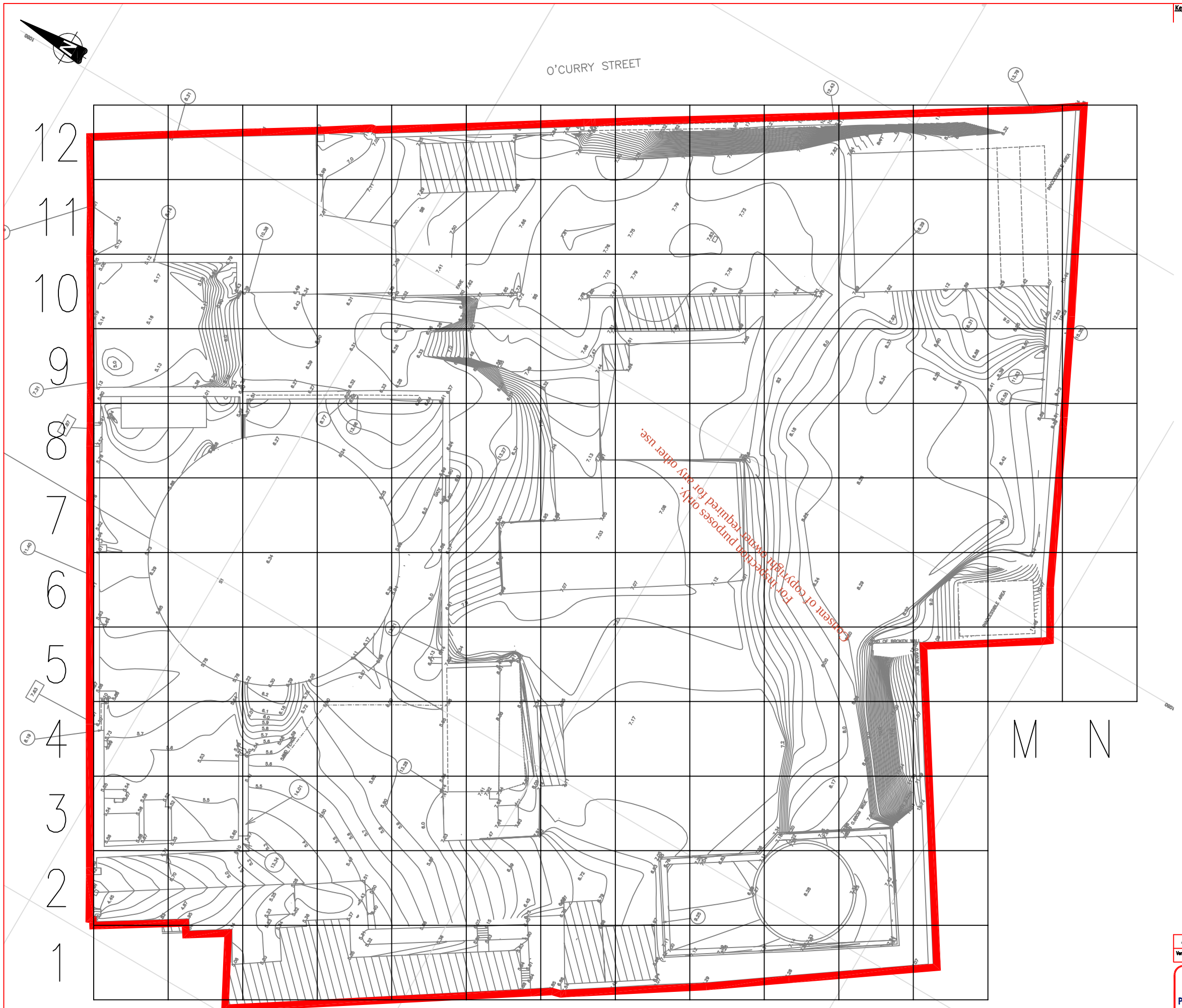
Version	Amendment	Originated by and date	Checked by and date	Approved by and date
A	First Issue	5/11/03	D.Field 5/11/03	Tony Brown 5/11/03

PARKMAN

FS 15024

Client	Bord Gáis
Project	Limerick Gasworks
Drawing Title	Exploratory Hole Location Plan with Estimated Rock Contours and Extent of Former Quarry
Purpose	Information
Draft / Issue	Issue
Scale	1:500 (A3)
Issuing Office	Cheshire
Telephone	(+44)0151 356 5555
Drawing number	Figure 3
Version	A

© Parkman copyright
EPA Export 29-05-2012:04:38:59



For inspection purposes only.
Consent of copyright owner required for any other use.

Key

Site Boundary

S1 Station

Version	Amendment	Originated by and date	Checked by and date	Approved by and date
A	First Issue	5/11/03	O.Kelly 5/11/03	D.Field 5/11/03

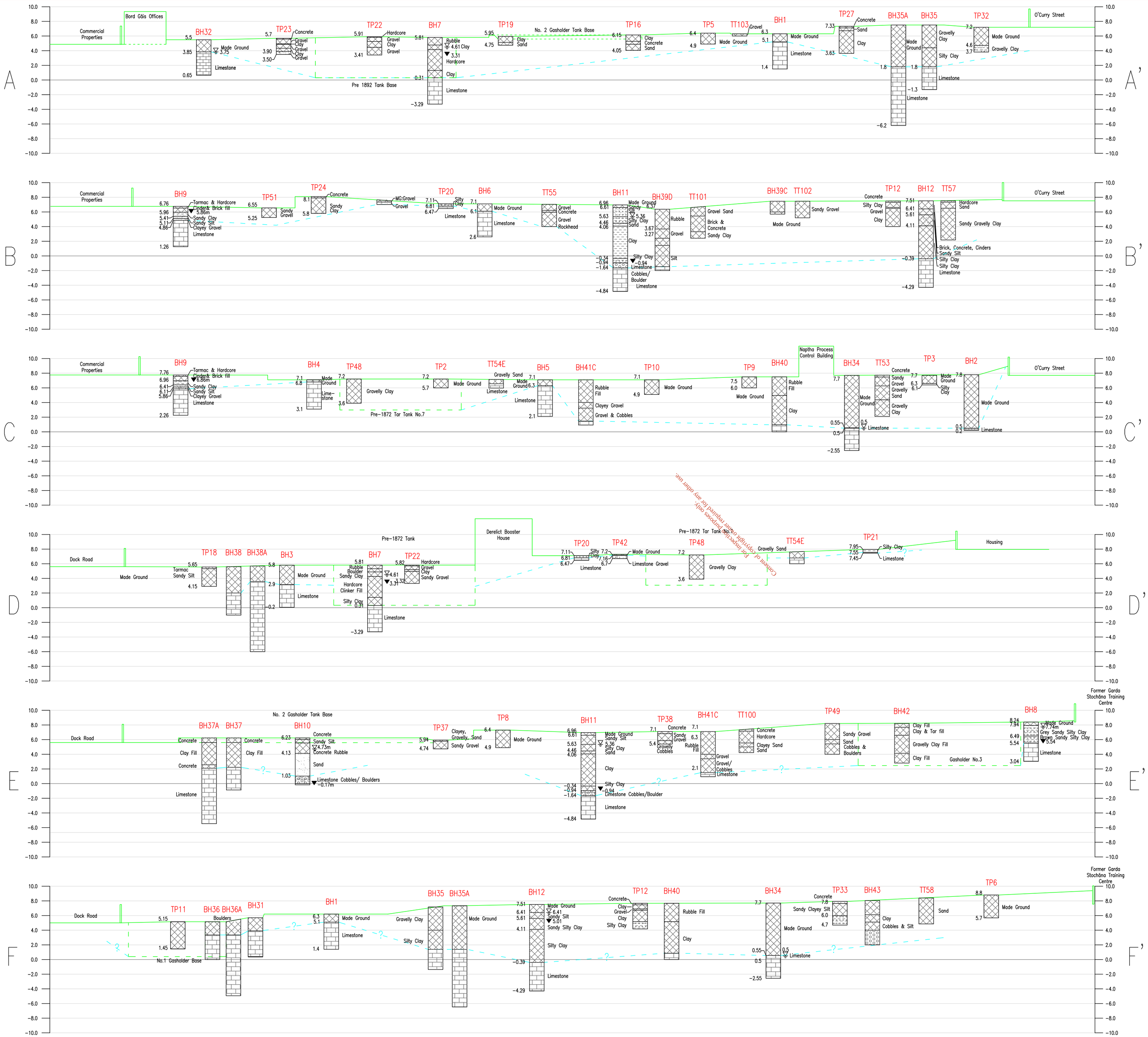
PARKMAN

FS 15024

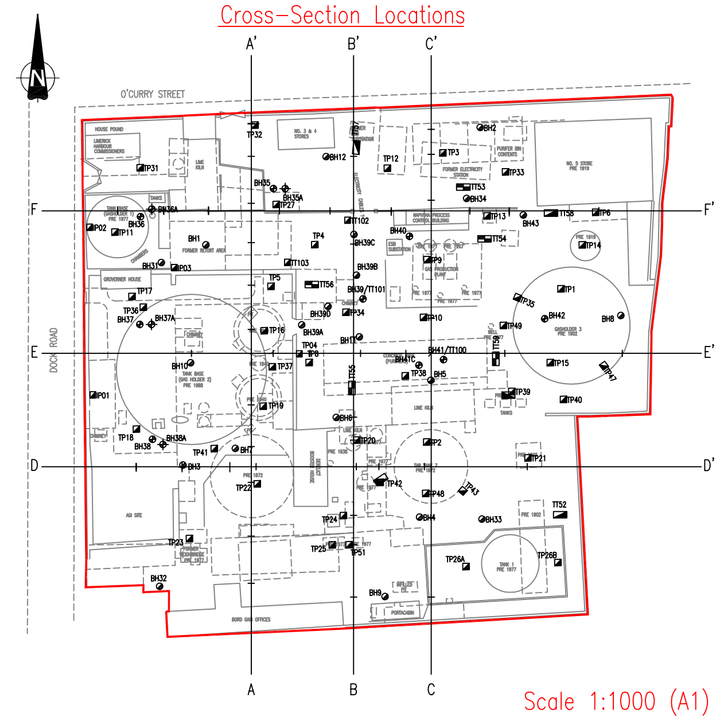
Client	Bord Gáis
Project	Limerick Gasworks
Drawing Title	Site Layout
Purpose	Information
Draft	●
Issue	
Scale	1:250 (A1) 1:500 (A3)
Issuing Office	Cheshire
Telephone	(+44) 0151 356 5555
Drawing Number	Figure 2
Version	A

© Parkman copyright

EPA Export 29-05-2012:04:38:59



Cross-Section Locations



Scale 1:1000 (A1)

Notes
All building heights for illustration purposes only.

Key

- Ground Profile and Above/Below Ground Structures
- Projected Surface of Limestone Bedrock
- Made Ground
- Clay
- Silt
- Sand
- Gravel
- Cobbles/ Boulders
- Water Level after 20 minutes
- Water Strike

Version	Amendment	Originated by and date	Checked by and date	Approved by and date
A	First Issue	02/10/03	V.Sankey 02/10/03	T.Brown 02/10/03

PARKMAN

FS 15024

Client	Bord Gáis
Project	Limerick Gasworks
Drawing Title	Site Section (Geology)
Purpose	Information
Draft / Issue	Draft ●
Scale	1:250 (A1)
Issuing Office	Cheshire
Telephone	(+44) 0151 356 5555
Drawing Number	Figure 4
Version	A

Copyright of Parkman plc. For internal purposes only. Not to be used for any other purpose without prior written consent.

© Parkman copyright

EPA Export 29-05-2012:04:38:05

GEOTECH SPECIALISTS LIMITED
Carewswood, Castlemartyr, Co. Cork, Ireland
Tel: (021) 4667164 Fax (021) 4667630
Email: geotech@indigo.ie

Limerick Gasworks

Limerick City.

REPORT ON GROUND INVESTIGATION

Factual Report No. KC3168

Engineer: Parkman Environment Ltd.

Client: Bord Gais Eireann.

For inspection purposes only.
Consent of copyright owner required for any other use.

Client:

Bord Gais Eireann
PO Box 51
Gas Works Road
Cork.

Engineer:
Parkman Environment Ltd,
Parkman House,
Lloyd Drive,
Ellesmere Port,
Cheshire
UK.
CH65 9HQ

EPA Export 29-05-2012:04:39:00

CONTENTS

		Page
1	INTRODUCTION	2
2	THE SITE AND GEOLOGY	2
	2.1 The Site	
	2.2 Published Geology	
3	FIELDWORK	3
	3.1 General	
	3.2 Exploratory Holes	
	3.3 In Situ Testing	
	3.4 Survey and Drawings	
4	LABORATORY TESTING	4
	REFERENCES	5

ENCLOSURES

A EXPLORATORY HOLE RECORDS

B LABORATORY RESULTS

C DRAWINGS

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:00

1 INTRODUCTION

During July 2003, Geotech Specialists Limited (GSL) were commissioned by Parkman Environment (PE), on behalf of Bord Gais Eireann (BGE), to carry out a ground investigation at the former gasworks site on the Dock Road in Limerick City. The investigation was required to obtain geoenvironmental and geotechnical information on the site, the soil conditions along the site and to determine the extent of the former quarry area and the nature of the material located within.

The scope of the investigation, which was specified by PE, comprised the drilling of cable tool and rotary boreholes, the installation of monitoring wells to determine water level and quality, geotechnical laboratory testing and the compilation of a factual report. These installations were installed using both cable tool and rotary drilling rigs.

This report presents the factual records of the fieldwork and laboratory testing.

For inspection purposes only.
Consent of copyright owner required for any other use.

2 THE SITE AND GEOLOGY

2.1 The Site

The site is located at National Grid reference R 576 574 of the Ordnance Survey Discovery Series Map Sheet 65 "Clare Limerick and Tipperary" 1:50,000 Scale.

The Limerick Gasworks site is located in Limerick City and is bounded by the Dock Road and O'Curry Street. The site is currently in use by BGE as a storage yard and the Limerick Regional Office. The site is composed of both hard standing areas which include the car parking areas for the office and former tank bases. There are a number of derelict buildings on the site which include a two storey former naphtha process control building, an ESB sub station, and the former Governor House.

In addition to these buildings, the site is enclosed by a limestone block wall which bounds the site. This wall is higher along the Dock Road and also encloses the locations of BH37- BH38 on 3 sides.

The site is bound to the east by residential housing with two vintners premises located to the west.

EPA Export 29-05-2012:04:39:00

2.2 Published Geology

The published geological map covering the site, GSI Sheet 17, Scale 1:100 000 indicates that the site is underlain by Carboniferous Visean Limestones.

3 FIELDWORK

3.1 General

The fieldwork was carried out in general accordance with BS 5930 (1999) and consisted of rotary and cable tool boreholes. The exploratory hole locations were selected by PE. The locations were also set out by Parkman having taken into account on site access conditions, at positions shown on Drawing 2, Enclosure C.

For inspection purposes only.
Consent of copyright owner required for any other use.

3.2 Exploratory Holes

This investigation comprised cable percussion boreholes and rotary drilled boreholes. The exploratory hole records are presented in Enclosure A and should be read in conjunction with the Key included therein.

SUMMARY OF EXPLORATORY HOLES

Type	Quantity	Maximum Depth (m)	Remarks
Cable Percussion Boring Only	10	7.05	Denoted BH35, BH39, BH39A, BH39C, BH39D, BH40, BH41, BH41C, BH42, BH43
Cable Percussion Boring extended by Rotary Core Drilling/Open Hole Drilling	1	6.65	Denoted BH38
Rotary Open Hole/Core Drilling Only	8	13.5	Denoted BHR35, BHR35A, BH36, BH36A, BH37, BH37A, BH38A

The records provide descriptions, in accordance with BS 5930 (1999), of the materials encountered and details of the samples taken, together with observations made during boring and drilling. Photographs of the rock cores recovered are presented separately.

EPA Export 29-05-2012:04:39:00

Trial pits and foundation inspection pits were undertaken on site and logged by PE. Environmental sampling of cable tool boreholes was carried out to supplied specifications and sampled using containers provided by PE .

3.3 Instrumentation and Monitoring

The instruments installed in the exploratory holes are shown on the logs and also detailed in Enclosure A after the borehole records. Monitoring was carried out by PE during the fieldwork period.

3.4 Survey and Drawings

The exploratory hole locations were set out on site by PE. The positions of the boreholes were located relative to existing features on the site by tape measure. The positions were subsequently surveyed by GSL. The levels (to Ordnance Datum Malin – relative to previous borehole positions) and co-ordinates (local grid relative to the previous borehole positions) are shown on the borehole records and are also tabulated in Enclosure A.

For inspection purposes only.
Consent of copyright owner required for any other use.

4 LABORATORY TESTING

On completion of the fieldwork all samples were retained on site. The laboratory testing scheduled by PE included point load testing of the rock samples, these tests were carried out on site.

The geotechnical testing was carried out in accordance ISRM (1981) and ISRM (1985). The testing is summarised below and the results are presented in Enclosure B.

SUMMARY OF GEOTECHNICAL LABORATORY TESTING

Type	Number of Tests
Point Load Tests	6

EPA Export 29-05-2012:04:39:00

Prepared By	**Andrew Jaworski BSc MSc**
Reviewed By	**A. Garne BSc MSc FGS**
Approved for Issue By	

REFERENCES

British Standards and Codes of Practice

BS 1377 : 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930 : 1999 : Code of practice for site investigations. British Standards Institution.

Maps

GSI Sheet 17 : The Shannon Estuary 1:100000 geological map (solid). Geological Survey of Ireland.

Ordnance Survey Landranger Series, Sheet 65 : 1988 :Clare Limerick and Tipperary. 1:50000. Ordnance Survey of Ireland.

Consent of copyright owner required for any other use.
For inspection purposes only.

Publications and Reports

ISRM : 1981 : Rock Characterisation, Testing and Monitoring - ISRM Suggested Methods (Ed E T Brown). Commission on Testing Methods, International Society for Rock Mechanics, Pergamon Press.

ISRM : 1985 : Suggested method for determining point load strength. Commission on Testing Methods, International Society for Rock Mechanics, International Journal of Rock Mechanics, Mining Sciences and Geomechanics Abstracts, Vol 22.

EPA Export 29-05-2012:04:39:00

ENCLOSURE A

EXPLORATORY HOLE RECORDS

For inspection purposes only.
Consent of copyright owner required for any other use.

Key to Exploratory Hole Records
Cable Tool & Rotary Borehole Logs

Key

BH35, BHR35, BHR35A, BH36, BH36A, BH37, BH37A, BH38, BH38A, BH39, BH39A, BH39C, BH39D, BH40, BH41, BH41C, BH42, BH43

EPA Export 29-05-2012:04:39:00

Key to Exploratory Hole Records

GEOTECH

SAMPLES

Undisturbed

U	Driven tube sample
TW	Pushed thin wall tube sample } nominally 100 mm diameter and full recovery unless otherwise stated
P	Pushed piston sample
L	Liner sample (from Windowless or similar sampler), full recovery unless otherwise stated
CBR	CBR mould sample
BLK	Block sample
CS	Core sample (from rotary core) taken for laboratory testing

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample
	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

TESTS

SPT S or SPT C	Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS 1377 : Part 9 (1990). The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 (either in total or for a single increment) the total blow count beyond the seating drive is given (without the N = prefix).

IV	In situ vane test, peak (p) and remoulded (r)
HV	Hand vane test, peak (p) and remoulded (r)
PP	Pocket penetrometer test, strength value
KFH, KRH, KPI	Variable head permeability tests (KFH = falling head test, KRH = rising head test, KPI = packer test), permeability value

Test results provided in Field Records column

Consent of copyright owner required for any other use. For inspection purposes only.

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930 (1999)

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacings are presented. The term non-intact (NI) is used where the core is fragmented.

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss

GROUNDWATER

▼	Groundwater strike
▽	Groundwater level after standing period

INSTALLATION

Standpipe/ piezometer

Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

The types of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer

Notes:	Project: Limerick Gasworks Project No.: KC3168 Carried out for: Parkman Environment Ltd	Key Sheet 1

EPA Export 29-05-2012:04:39:00

ENCLOSURE B
GEOTECHNICAL LABORATORY TEST RESULTS

For inspection purposes only.
Consent of copyright owner required for any other use.

Point Loads Test Results B1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC Logged by Checked by AG	Start 29/07/2003 End 29/07/2003	Equipment, Methods and Remarks Inspection Pit from 0.00m - 1.20m. Cable Percussion 200mm diameter from 1.20m - 6.00m.	Depth from 1.20m to 6.00m Diameter 200mm Casing Depth	Ground Level +8.54 mOD Coordinates 97.36 Local Grid 150.13

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 1			
1.50-1.95	SPT C	N=7 (1,1/2,1,2,2)		
1.80-2.30	B 2			
2.50-2.95	SPT C	N=40 (2,2/2,2,12,24)		
3.10-3.50	B 3			
3.50-3.95	SPT C	N=26 (6,8/7,7,6,6)		
3.90-4.50	B 4			
4.50-4.95	SPT C	N=13 (6,6/3,3,3,4)		
4.80-5.20	B 5			
5.50-5.90	SPT C	81 (6,8/10,22,24,25 for 20mm)	29/07/2003	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND**	(2.00)		
MADE GROUND: White sandy CLAY with traces of silt**	2.00 +6.54 (1.10)		
MADE GROUND: Angular COBBLES and sandy SILT**	3.10 +5.44 (0.90)		
Broken fragments of ROCK**	4.00 +4.54 (1.00)		
Broken ROCK with large COBBLES**	5.00 +3.54 (1.00)		
EXPLORATORY HOLE ENDS AT 6.00 m	6.00 +2.54		

For inspection purposes only.
Consent of copyright owner required for any other use.

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.80	Rose to 1.50 m after 20 minutes.	

Depth Related Remarks

From	to (m)	
0.00	6.00	Environmental sampling taken as specified by Parkman.

Chiselling

Depths (m)	Time	Tools used
2.80 -3.10	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 19/09/2003 10:57:10

AGS

Project Limerick Gas Works

Project No. KC3168

Carried out for Bord Gais Eireann

Borehole

BH43

Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	JC
Logged by	
Checked by	AG

Start	24/07/2003
End	30/07/2003

Equipment, Methods and Remarks
Inspection Pit from 0.00m - 1.20m. Cable Percussion 200mm diameter from 1.20m - 5.30m.

Depth from	to	Diameter	Casing Depth
1.20m	5.30m	200mm	5.30m

Ground Level	+8.08 mOD
Coordinates	77.91
Local Grid	137.46

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
1.00	B 1			
1.50-1.95	SPT C	N=34 (10,10/8,10,8,8)	1.50	
2.00	B 2			
2.50-2.80	SPT C	50 (8,15/25,25,- for 0mm)	2.50 24/07/2003 2.50	1.00
3.50-3.95	SPT C	N=6 (1,-/1,-,1,4)	28/07/2003 3.00 ~~3.00~~	~~1.00~~
4.50-4.95	SPT C	N=8 (1,2/1,2,2,3)	4.50	1.00
5.30-5.75	SPT C	N=31 (18,18/16,10,2,3)	29/07/2003 30/07/2003 ~~5.30~~ 5.30	~~1.00~~

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: CLAY, BOULDER and broken concrete**	(0.50)		
	0.50 +7.58		
MADE GROUND: Black CLAY and tar fill**	(1.00)		1
	1.50 +6.58		
MADE GROUND: Stiff black gravelly CLAY and fill**	(2.40)		1
	3.90 +4.18		
MADE GROUND: Firm brown CLAY and fill with a strong odour**	(1.40)		SP
	5.30 +2.78		
EXPLORATORY HOLE ENDS AT 5.30 m			

Consent of copyright owner required for any other use. For inspection purposes only.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.00	Rose to 1.00 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
1.00	5.00	Environmental sampling taken as specified by Parkman.

Chiselling

Depths (m)	Time	Tools used
0.10 -0.40	30 mins	
1.20 -1.40	30 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column

Scale 1:50

(c) MESG HBIII (281), 19/09/2003 13:10:01

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole

BH42

Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	BJ
Logged by	AJ
Checked by	AG

Start 12/08/2003
End 12/08/2003

Equipment, Methods and Remarks
Cable Percussion 200mm diameter from 0.00m - 6.06m.

Depth from	to	Diameter	Casing Depth
0.00m	6.06m	200mm	6.00m

Ground Level	+7.23 mOD
Coordinates	116.55
Local Grid	140.82

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
3.00-3.45 3.00-3.45 3.00-3.50	SPT S D 1 B 2	N=21 (3,4/8,4,4,5)	3.00	dry
4.00-4.45 4.00-4.45 4.00-4.50	SPT S D 3 B 4	N=34 (2,3/4,9,9,12)	4.00	3.30
5.00-5.45 5.00-5.45 5.00-5.50	SPT S D 5 B 6	N=70 (8,10/14,17,19,20)	5.00	3.90
5.80-6.00 5.80-6.00 6.00-6.06	SPT S D 7 SPT C	50 (19,8 for 20mm/ 31,19 for 30mm) 50 (25 for 20mm/50 for 40mm)	5.80 12/08/2003 6.00	4.10 4.70

Strata

Description	Depth,Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Rubble fill**	(3.00)		
MADE GROUND: Medium dense slightly sandy clayey GRAVEL. Gravel is angular to subangular fine to coarse. Possibly contaminated with tar/ hydrocarbons. 3.40 m Coal Tar odour	3.00 +4.23 (0.50) 3.50 +3.73		
MADE GROUND: Dense GRAVEL and COBBLES. Gravel is angular to subangular medium to coarse. Cobbles are angular to subangular.	(2.30)		SP
Grey brown mottled black slightly clayey gravelly SAND with Cobbles. Gravel and cobbles of angular to subangular Limestone. (Possible Rock head)	5.80 +1.43 (0.26) 6.06 +1.17		
EXPLORATORY HOLE ENDS AT 6.06 m			

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	3.40	-	-

Depth Related Remarks

From	to (m)	
0.00	6.06	Environmental sampling taken as specified by Parkman.

Chiselling

Depths (m)	Time	Tools used
2.10 -2.30	30 mins	
5.80 -6.00	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG HBIII (281), 19/09/2003 10:58:58

Project: Limerick Gas Works
Project No.: KC3168
Carried out for: Bord Gais Eireann

Borehole
BH41C
Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC	Start 26/07/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+7.23 mOD
Logged by	End 26/07/2003	Inspection Pit from 0.00m - 0.40m. Cable Percussion 200mm diameter from 0.40m - 1.00m.	0.40m	1.00m	200mm		Coordinates	116.66 140.90
Checked by AG							Local Grid	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			26/07/2003	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Bricks and CLAY**	(0.40)		
	0.40 +6.83		
MADE GROUND: Limestone BOULDER**	(0.40)		
	0.80 +6.43		
MADE GROUND: Slab of concrete**	1.00 +6.23		
EXPLORATORY HOLE ENDS AT 1.00 m			

For inspection purposes only.
Consent of copyright owner required for any other use.

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 18/09/2003 10:56:54 AGS

Project Limerick Gas Works

Project No. KC3168

Carried out for Bord Gais Eireann

Borehole

BH41

Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by BJ Logged by Checked by AG	Start 13/08/2003 End 13/08/2003	Equipment, Methods and Remarks Inspection Pit from 0.00m - 1.20m. Cable percussion 200mm diameter from 1.20m - 7.05m.	Depth from 1.20m	to 7.05m	Diameter 200mm / Casing Depth 6.60m

Ground Level +7.63 mOD
Coordinates 97.70
Local Grid 116.92

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
1.50-1.95	SPT S	N=23 (4,8/9,3,5,6)	1.50	dry
1.50-1.95	D 1		1.50	dry
2.50-2.95	SPT S	N=18 (3,2/4,4,5,5)	2.50	dry
2.50-2.95	D 2		2.50	dry
2.50-3.00	B 3			
3.50-3.95	SPT S	N=18 (2,4/3,2,4,9)	3.00	dry
3.50-3.95	D 4		3.00	dry
3.50-4.00	B 5			
4.50-4.95	SPT S	N=7 (1,2/2,1,2,2)	4.50	dry
4.50-4.95	D 6		4.50	dry
4.50-5.00	B 7			
5.50-5.95	SPT S	N=37 (3,6/25,6,3,3)	5.50	dry
5.50-5.95	D 8		5.50	dry
5.50-6.00	B 9			
6.00-6.69	D 10		6.00	dry
6.60-6.69	SPT S	(75 for 90mm)	6.00	dry
			13/08/2003	1800
7.00-7.05	SPT C	(75 for 50mm)	6.60	dry

Strata

Description	Depth, Level (Thickness)
MADE GROUND: Rubble fill**	(2.50)
	2.50 +5.13
MADE GROUND: Soft grey CLAY with rubble**	(4.10)
	6.60 +1.03
Hard dark grey LIMESTONE**	(0.45)
	7.05 +0.58
EXPLORATORY HOLE ENDS AT 7.05 m	

Legend: SP

Backfill/Instruments

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
0.00	7.05	Environmental sampling taken as specified by Parkman.

Chiselling

Depths (m)	Time	Tools used
2.10 -2.40	60 mins	
6.60 -7.00	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 18/09/2003 10:56:48

AGS

Project: Limerick Gas Works
Project No.: KC3168
Carried out for: Bord Gais Eireann

Borehole
BH40
Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by BJ Logged by AJ Checked by AG	Start 12/08/2003 End 13/08/2003	Equipment, Methods and Remarks Cable Percussion 200mm diameter from 0.00m - 8.03m.	Depth from 0.00m to 8.03m Diameter 200mm Casing Depth 7.90m	Ground Level +6.39 mOD Coordinates 116.95 Local Grid 109.92

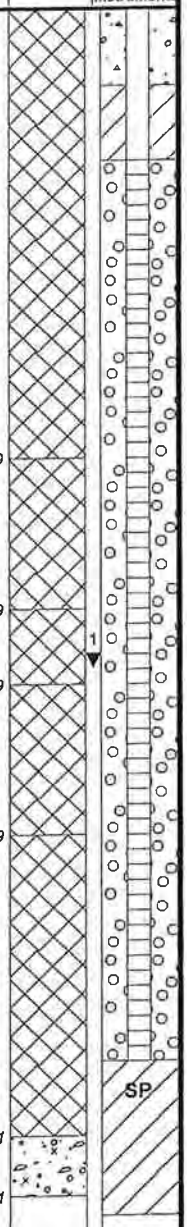
Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
4.00-4.45 4.00-4.45 4.00-4.50	SPT S D 1 B 2	N=15 (1,2/3,4,4,4)	4.00	dry
5.00-5.45 5.00-5.45 5.00-5.50	SPT S D 3 B 4	N=14 (3,2/4,3,3,4)	5.00	4.70
6.00-6.45 6.00-6.50	SPT S B 5	N=11 (1,2/2,2,3,4)	6.00	5.10
7.50-7.72 7.50-7.72	SPT S D 6	75 (13,9/25 for 30mm)	12/08/2003 7.50 7.50	1800 6.30 6.00
7.90-8.03	SPT C	(75 for 130mm)	13/08/2003 7.50 13/08/2003 7.90 7.90	0800 6.00 1800 7.30 7.30

Strata

Description	Depth, Level (Thickness)
MADE GROUND: Rubble fill**	(3.00)
MADE GROUND**	3.00 +3.39 (1.00)
MADE GROUND: Loose slightly silty sandy GRAVEL with possible tar / hydrocarbon contamination.	4.00 +2.39 (0.50)
MADE GROUND: Grey mottled black slightly silty sandy GRAVEL with occasional cobbles. Possible tar / hydrocarbon contamination evident.	4.50 +1.89 (1.00)
MADE GROUND: Soft grey mottled black slightly sandy gravelly SILT with occasional limestone cobbles. Possible tar / hydrocarbon contamination evident.	5.50 +0.89 (2.00)
Possibly contaminated slightly gravelly sandy silt with Limestone cobbles (Probable Bedrock)	7.50 -1.11 (0.40)
EXPLORATORY HOLE ENDS AT 8.03 m	7.90 -1.51

Legend / Backfill/Instruments



Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	4.30	-	-

Depth Related Remarks

From	to (m)	
0.00	8.03	Environmental sampling taken as specified by Parkman.
7.70	7.70	Coal tars**

Chiselling

Depths (m)	Time	Tools used
0.50 -1.20	90 mins	
7.70 -7.90	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 19/08/2003 10:56:42

AGS

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole

BH39D

Sheet 1 of 1

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC Logged by Checked by AG	Start 25/07/2003 End 26/07/2003	Equipment, Methods and Remarks Inspection Pit from 0.00m - 1.20m. Cable Percussion 200mm diameter from 1.20m - 1.70m.	Depth from / to / Diameter / Casing Depth 1.20m / 1.70m / 200mm	Ground Level +7.66 mOD Coordinates 106.12 Local Grid 103.35

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
1.40-1.70 1.40	SPT S D 2	67 (5,9/8,9,25 for 0mm)	25/07/2003 26/07/2003	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
MADE GROUND**	(1.70)		
EXPLORATORY HOLE ENDS AT 1.70 m 1.70 m Concrete**	1.70 +5.96		

For inspection purposes only.
Consent of copyright owner required for any other use.

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
0.00	1.70	Environmental sampling taken as specified by Parkman.
1.70	1.70	Borehole terminated due to concrete obstruction.

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 18/09/2003 10:56:37

AGS

Project: Limerick Gas Works
Project No.: KC3168
Carried out for: Bord Gais Eireann

Borehole: **BH39C**
Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC Logged by Checked by AG	Start 25/07/2003 End 25/07/2003	Equipment, Methods and Remarks Inspection Pit from 0.00m - 1.00m.	Depth from to Diameter Casing Depth	Ground Level +6.48 mOD Coordinates 120.51 Local Grid 110.17

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			25/07/2003	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
MADE GROUND**	(1.00)		
EXPLORATORY HOLE ENDS AT 1.00 m 1.00 m Slab of concrete**	1.00 +5.48		

For inspection purposes only.
Consent of copyright owner required for any other use.

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
1.00	1.00	Borehole terminated due to concrete obstruction.

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEBG HBIII (281), 19/09/2003 10:56:33 AGS

Project Limerick Gas Works
Project No. KC3168
Carried out for Bord Gais Eireann

Borehole
BH39A
Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC	Start 25/07/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+7.06 mOD
Logged by	End 25/07/2003	Inspection Pit from 0.00m - 1.20m. Cable Percussion 200mm diameter from 1.20m - 1.36m.	1.20m	1.36m	200mm		Coordinates	114.18
Checked by AG							Local Grid	114.07

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 1		25/07/2003	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND**	(1.35)		
MADE GROUND: Slab of concrete**	1.35 +5.71		
EXPLORATORY HOLE ENDS AT 1.36 m	1.36 +5.70		

Depth	Type & No	Records	Date Casing	Time Water

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
0.00	1.36	Environmental sampling taken as specified by Parkman.
1.36	1.36	Borehole terminated due to concrete obstruction.

Chiselling

Depths (m)	Time	Tools used
1.35 -1.36	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 19/09/2003 10:56:29

AGS

Project: Limerick Gas Works

Project No.: KC3168

Carried out for: Bord Gais Eireann

Borehole: BH39

Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	TB
Logged by	AJ
Checked by	AG

Start	08/08/2003
End	09/08/2003

Equipment, Methods and Remarks
Inspection Pit from 0.00m - 1.20m. Rotary Open Hole 120mm diameter from 1.20m - 1.90m. Rotary Cored 90mm diameter from 1.90m - 11.50m.

Depth from	to	Diameter	Casing Depth
1.20m	1.90m	120mm	2.70m
1.90m	11.50m	90mm	

Ground Level	+5.79 mOD
Coordinates	167.98
Local Grid	100.35

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
1.20-1.90 m	0 0 0	OPEN HOLE		
1.90-2.30 m	100 63 50 NI 70 200		08/08/2003 1.90	
2.30-2.70 m	100 45 35			
2.70-3.45 m	73 24 24			
3.45-4.45 m	90 73 44 NI 80 220			
4.45-5.95 m	97 35 29			
5.95-7.45 m	69 37 37 NI 60 430			
7.45-8.95 m	97 38 38			
8.95-10.00 m	100 43 37 NI 100 390			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description		Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
MADE GROUND**		(1.90)		
Moderately strong to strong grey fine grained LIMESTONE.	1.90-2.70 m NI/70/200	1.90 +3.89		
Fractures are extremely closely to closely spaced subvertical to subhorizontal predominantly subhorizontal. Some clay infilling present on fractures with hydrocarbon staining.	2.40-2.70 m Some hydrocarbon staining present. 2.70-2.90 m NI/40/60 2.90-3.45 m Clay infilling limestone claybound gravel. Slight hydrocarbon/tar staining evident	(0.80) 2.70 +3.09		
Moderately strong to strong grey fine grained LIMESTONE. Fractures are predominantly subhorizontal with rare subvertical fractures. 2.90m - 3.45m, large clay infilled section recovered as claybound limestone GRAVEL. Gravel is angular to subangular medium to coarse. Some hydrocarbon staining present.		(1.75)		
Moderately strong to strong grey fine grained LIMESTONE. 5.25m: Limestone becomes weathered, evidence of clay filled cavities. 5.95m: Clay band in rock. 5.95m - 6.70m: No returns (void). 6.70m - 7.45m: Moderately weak to moderately strong fine grained limestone. Fractures predominantly subhorizontal. Limestone highly weathered giving honeycomb apperance.	4.45-5.25 m Limestone 5.25-5.90 m Weathered limestone with clay infilling 5.90-5.95 m Clay band. 5.95-6.75 m Void - no returns. 6.70-7.45 m Weathered limestone rock.	4.45 +1.34 (3.00)		
Moderately weak to moderately strong fine grained LIMESTONE. Fractures are predominantly subhorizontal with some subvertical. Fractures show clay infilling especially subvertical. Some calcite veining also present within rock.	7.45-8.35 m Weathered limestone bands of rock with clay infilling. 8.35-8.55 m Clay band in rock on subvertical fracture. 8.55-9.75 m Weathered limestone rock with clay infilling.	7.45 -1.66 (1.50)		
Moderately weak to strong fine grained grey LIMESTONE. Fractures are extremely closely to closely spaced subvertical to subhorizontal. Clay infilling	9.75-10.00 m Clay infilling	8.95 -3.16 (1.05)		
Stratum continued next sheet				

For inspection purposes only. Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG Hill (281), 19/09/2003 10:56:16

AGS

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole
BH38A
Sheet 1 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	TB
Logged by	AJ
Checked by	AG

Start 08/08/2003
End 09/08/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
1.20m	1.90m	120mm	2.70m
1.90m	11.50m	90mm	

Ground Level	+5.79 mOD
Coordinates	167.98
Local Grid	100.35

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.00-11.50 m	93 37 23			09/08/2003 2.70	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
predominantly in subvertical fractures. Limestone shows evidence of chemical weathering (honeycombing). within limestone rock. Barrel blocks due to clay banding. 10.00-11.50 m NI/130/200	10.00 -4.21		
Moderately strong to strong fine grained grey LIMESTONE with clay infilling. Fractures are subhorizontal to subvertical.	(1.50)		SP
EXPLORATORY HOLE ENDS AT 11.50 m	11.50 -5.71		

Depth | TCR SCR RQD | If | Records/Samples | Date Casing | Time Water

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 19/09/2003 10:56:21

AGS

Project Limerick Gas Works
Project No. KC3168
Carried out for Bord Gais Eireann

Borehole

BH38A
Sheet 2 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC/TB Logged by AJ Checked by AG	Start 30/07/2003 End 08/08/2003	**Equipment, Methods and Remarks** Inspection Pit from 0.00m - 1.20m. Cable Percussion 200mm from 1.20m - 3.00m. Rotary Open Hole 120mm diameter from 3.00m - 3.15m. Rotary Cored 90mm diameter from 3.15m - 6.65m.	Depth from 1.20m 3.00m 3.15m	to 3.00m 3.15m 6.65m	Diameter 200mm 120mm 90mm	Casing Depth 3.15m	Ground Level +5.84 mOD Coordinates 167.80 Local Grid 99.34

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 1			
1.50-1.95	SPT C	N=8 (1,1/2,2,2,2)		
2.80-2.95	SPT C	(10,27/25 for 0mm)	30/07/2003	
3.15-4.65 m	97 45 30	100 120 120		
4.65-6.15 m	93 91 75	NI 230 390		
6.15-6.65 m	114 96 96	110 150 230	08/08/2003 3.15	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND**			
1.40-3.15 m Black tar liquid noted.	(3.15)		
MADE GROUND: Concrete, limestone cobbles and brick, recovered in the core barrel.	3.15 +2.69 (0.50) 3.65 +2.19		
Moderately strong to strong fine grained grey LIMESTONE. Fractures are predominantly subhorizontal stepped rough. Some subvertical fractures evident. Closely spaced with clay infilling and smearing present along fractures. 3.77 m Subhorizontal stepped rough fracture. 4.35 m Subvertical fracture. 4.65-4.80 m Non intact clay infilling	(1.00)		
Moderately strong to strong grey fine grained LIMESTONE. Fractures are closely spaced predominantly subhorizontal. Some clay smearing evident but most fractures clean. Subvertical fracture with clay infilling at 4.65m - 4.80m. 4.80-6.15 m Fracture spacing 150/230/390	4.65 +1.19 (1.50)		
Strong grey fine grained LIMESTONE. Fractures are closely spaced subvertical to subhorizontal calcite veins evident in core. Fractures are a combination of planar smooth and stepped rough. No clay smearing evident. 6.15-6.65 m Fracture spacing 110/150/230	6.15 -0.31 (0.50) 6.65 -0.81		SP
EXPLORATORY HOLE ENDS AT 6.65 m			

For inspection purposes only.
Consent of copyright owner required for any other use.

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
0.00	3.00	Environmental sampling taken as specified by Parkman.

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 7/8/08/2003 12:48:34 AGS

Project: Limerick Gas Works
Project No.: KC3168
Carried out for: Bord Gais Eireann

Borehole
BH38
Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	TB
Logged by	AJ
Checked by	AG

Start 16/08/2003
End 18/08/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	3.60m	120mm	3.30m
3.60m	12.05m	90mm	

Ground Level	+6.35 mOD
Coordinates	148.73
Local Grid	80.75

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.05-10.95 m	100 97 97			18/08/2003	0800 3.30
10.95-12.05 m	73 72 56	60 130 250		18/08/2003	1800 3.30

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Strong to very fine grained light grey LIMESTONE. Fractures are predominantly subhorizontal planar rough with stepped rough fractures. Hydrocarbon / Tar staining evident within fractures.			
Strong to very strong fine grained LIMESTONE . Fractures are predominantly subhorizontal planar rough with rare stepped rough fracture. Tar staining evident on some fractures.	10.95 -4.60 (1.10)		
EXPLORATORY HOLE ENDS AT 12.05 m	12.05 -5.70		SP

Depth | TCR SCR RQD | If | Records/Samples | Date Casing | Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG HBIII (281), 16/09/2003 11:07:54

AGS

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole
BH37A
Sheet 2 of 2

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	TB
Logged by	AJ
Checked by	AG

Start 16/08/2003
End 18/08/2003

Equipment, Methods and Remarks
Rotary Open Holed 120mm diameter from 0.00m - 3.60m Rotary Cored 90mm diameter from 3.60m - 12.05m.

Depth from	to	Diameter	Casing Depth
0.00m	3.60m	120mm	3.30m
3.60m	12.05m	90mm	

Ground Level	+6.35 mOD
Coordinates	148.73
Local Grid	80.75

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			16/08/2003	0800
3.60-4.90 m	100 92 52	NI 140 360		
4.90-5.75 m	100 100 93			
5.75-7.15 m	96 91 87			
7.15-8.60 m	95 89 87	200 240 400		
8.60-10.05 m	99 96 95			
			16/08/2003 3.30	1800

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Concrete.	(0.65)		
MADE GROUND: Clay fill below concrete slab.	0.65 +5.70		
	(2.95)		
MADE GROUND: Concrete. 3.60 m Tar hydrocarbon contamination evident in returns.	3.60 +2.75 (0.30) 3.90 +2.45		
Strong to very strong fine grained grey LIMESTONE. Fractures are predominantly subhorizontal planar rough extremely closely to medium spaced. Possible Tar presence within fractures.	(1.85)		
Strong to very fine grained light grey LIMESTONE. Fractures are predominantly subhorizontal planar rough with stepped rough fractures. Hydrocarbon / Tar staining evident within fractures.	5.75 +0.60		
	(5.20)		
Stratum continued next sheet			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

For inspection purposes only. Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 16/09/2003 11:07:51 AGS

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole
BH37A
Sheet 1 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by TB Logged by AJ Checked by AG	Start 18/08/2003 End 18/08/2003	Equipment, Methods and Remarks Rotary Open Holed 120mm diameter from 0.00m - 3.80m. Rotary Cored 90mm diameter from 3.80m - 6.80m.	Depth from / to / Diameter / Casing Depth 0.00m / 3.80m / 120mm 3.80m / 6.80m / 90mm	Ground Level +6.35 mOD Coordinates 146.48 Local Grid 81.34

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
3.80-5.30 m	97 81 62	NI 100 400		
5.30-6.80 m	95 60 37		18/08/2003	

Strata

Description	Depth, Level (Thickness)
MADE GROUND: Concrete**	(0.65)
MADE GROUND: Clay fill**	0.65 +5.70 (3.15)
Strong to very strong fine grained grey fossilised LIMESTONE. Fractures are extremely closely to widely spaced predominantly subhorizontal planar rough with rare stepped rough fractures. 3.80-3.85 m Assumed Zone of Core Loss 3.85-4.00 m non Intact 4.00-6.80 m Tar contamination evident within fractures	3.80 +2.55 (2.40)
Strong grey fine grained LIMESTONE with vertical planar rough fracture. Fracture shows evidence of Tar/ Hydrocarbon contamination.	6.20 +0.15 (0.60)
EXPLORATORY HOLE ENDS AT 6.80 m	6.80 -0.45

Legend / Backfill/ Instruments: SP

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 19/08/2003 12:46:28 AGS

Project: Limerick Gas Works

Project No.: KC3168

Carried out for: Bord Gais Eireann

Borehole: **BH37**

Sheet 1 of 1

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by TB Logged by AJ Checked by AG	Start 12/08/2003 End 13/08/2003	Equipment, Methods and Remarks Rotary Open Hole 120mm diameter from 0.00m - 2.20m. Rotary Cored 90mm diameter from 2.20m - 10.30m.	Depth from / to / Diameter / Casing Depth 0.00m / 2.20m / 120mm / 2.20m 2.20m / 10.30m / 90mm	Ground Level +5.31 mOD Coordinates 126.86 Local Grid 61.32	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.00-2.20 m	0 0 0		OPEN HOLE		
2.20-3.60 m	96 75 71	NI 120 300			
3.60-4.95 m	104 66 59				
4.95-6.45 m	87 85 79			12/08/2003 2.20	
6.45-7.75 m	98 79 64	30 200 540			
7.75-8.85 m	100 100 100				
8.85-10.30 m	99 70 70				

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Concrete and BOULDERS**	(2.20)		
Moderately strong to very strong fine grained grey LIMESTONE. Fractures are extremely closely to medium spaced predominantly subhorizontal. Fractures are stepped rough, planar smooth. At 4.10m, section of non intact core. 2.20-2.25 m Assumed zone of core loss. 2.25-3.45 m Limestone, stepped rough fracture. 3.45-3.60 m Zone of weathering in core, evidence of some clay infilling. 3.60-4.05 m Limestone rock. 4.05-4.15 m Non intact core, both vertical and horizontal fractures. 4.15-9.31 m Limestone.	2.20 +3.11 (2.75) 4.95 +0.36		
Strong to very strong grey fine grained LIMESTONE. Fractures are closely to medium spaced predominantly subhorizontal planar rough with rare stepped rough fractures. Rare subvertical fractures present, some calcite veins evident. 9.31-9.51 m Section of vertical and horizontal fractures combined. Stratum continued next sheet	(5.35)		

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (261), 16/09/2003 10:55:40 AGS

Project: Limerick Gas Works
Project No.: KC3168
Carried out for: Bord Gais Eireann

Borehole

BH36A

Sheet 1 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by TB Logged by AJ Checked by AG	Start 12/08/2003 End 13/08/2003	Equipment, Methods and Remarks	Depth from / to / Diameter / Casing Depth 0.00m / 2.20m / 120mm / 2.20m 2.20m / 10.30m / 90mm	Ground Level +5.31 mOD Coordinates 128.86 Local Grid 61.32

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing / Time Water
				13/08/2003 2.20

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong to very strong grey fine grained LIMESTONE. Fractures are closely to medium spaced predominantly subhorizontal planar rough with rare stepped rough fractures. Rare subvertical fractures present, some calcite veins evident. EXPLORATORY HOLE ENDS AT 10.30 m	10.30 -4.99		SP

Depth	TCR SCR RQD	If	Records/Samples	Date Casing / Time Water

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEGG Hill (281), 19/08/2003 10:55:44

Project Limerick Gas Works

Project No. KC3168

Carried out for Bord Gais Eireann

Borehole

BH36A

Sheet 2 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by	TB
Logged by	AJ
Checked by	AG

Start	11/08/2003
End	12/08/2003

Equipment, Methods and Remarks
Rotary Open Hole 120mm diameter from 0.00m - 2.20m. Rotary Cored 90mm diameter from 2.20m - 5.10m.

Depth from	to	Diameter	Casing Depth
0.00m	2.20m	120mm	1.20m
2.20m	5.10m	90mm	

Ground Level	+5.30 mOD
Coordinates	129 47
Local Grid	60.67

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.00-2.20 m	0 0 0		OPEN HOLE		
2.20-2.95 m	75 63 52	20 90 260			
2.95-4.10 m	100 100 93			11/08/2003 1.20	
4.10-5.10 m	100 88 68			12/08/2003	

Strata

Description		Depth,Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Concrete slab and BOULDERS**		(2.20)		
Moderately strong to strong coarse grained grey LIMESTONE with numerous calcite veins.	2.20-2.39 m Assumed zone of core loss. 2.39-2.95 m 110/190/260	2.20 +3.10		
Fractures are closely spaced predominantly subhorizontal planar smooth with occasional stepped rough fractures. Some clay infilling evident at 4.00m. Rare subvertical fracture present at 4.90m.	2.95-4.10 m 20/90/240	(2.90)		
	4.10-4.12 m Clay infilling. 4.12-5.10 m 80/120/200			SP
EXPLORATORY HOLE ENDS AT 5.10 m		5.10 +0.20		

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 18/09/2003 10:55:34 AGS

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole
BH36
Sheet 1 of 1

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by TB	Start 13/08/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+7.47 mOD
Logged by	End 15/08/2003		0.00m	5.60m	120mm	5.60m	Coordinates	105.88
Checked by AG			5.60m	13.50m	90mm		Local Grid	84.28

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.85-11.30 m	99 93 88	50 390 570		14/08/2003 5.60	1800
11.30-12.80 m	96 90 85			15/08/2003 5.60	0800
12.80-13.50 m	100 100 100	120 240 290		15/08/2003 5.60	1800

Strata

Description	Depth,Level (Thickness)	Legend	Backfill/ Instruments
Strong to very strong coarse grained light grey limestone . Fractures are closely to medium spaced predominantly subhorizontal planar rough with rare stepped rough fractures. Hydrocarbon/ tar staining evident within fractures down to base of borehole. Some evidence of Silt infilling from 12.80 to 13.50m.	(6.25)		
EXPLORATORY HOLE ENDS AT 13.50 m	13.50 -6.03		SP

For inspection purposes only.
Consent of copyright owner required for any other use.

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 19/09/2003 10:57:27 AGS

Project Limerick Gas Works

Project No. KC3168

Carried out for Bord Gais Eireann

Borehole **BHR35A**

Sheet 2 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by TB Logged by Checked by AG	Start 13/08/2003 End 15/08/2003	Equipment, Methods and Remarks Rotary Open Holed 120mm diameter from 0.00m - 5.60m Rotary Cored 90mm diameter from 5.60m - 13.50m	Depth from / to / Diameter / Casing Depth 0.00m / 5.60m / 120mm / 5.60m 5.60m / 13.50m / 90mm	Ground Level +7.47 mOD Coordinates 105.88 Local Grid 84.28	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			13/08/2003	0800
5.60-7.25 m	88 64 64	If NI/NI/NI		
			13/08/2003	1800
			5.60	
7.25-8.45 m	100 93 93		14/08/2003	0800
			5.60	
8.45-9.05 m	100 85 78			
9.05-9.85 m	99 91 91			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description		Depth, Level (Thickness)
MADE GROUND**		(5.60)
Moderately weak Limestone with Heavy Hydrocarbon Staining.	5.60-5.70 m Non intact heavy contamination.	5.60 +1.87 5.70 +1.77
Strong to very strong coarse grained light grey Limestone . Fractures are closely to widely spaced subhorizontal planar rough. Hydrocarbon / Tar smearing present on Core surface and within fractures.	5.70-5.80 m Assumed Zone of Core Loss 5.80-7.25 m Core Stained with Tar	(1.55)
Strong to very strong coarse grained light grey limestone . Fractures are closely to medium spaced predominantly subhorizontal planar rough with rare stepped rough fractures. Hydrocarbon/ tar staining evident within fractures down to base of borehole. Some evidence of Silt infilling from 12.80 to 13.50m.	7.25-8.45 m 200/320/440	7.25 +0.22
Stratum continued next sheet		

For inspection purposes only.
Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 19/09/2003 10:57:22 AGS

Project Limerick Gas Works

Project No. KC3168

Carried out for Bord Gais Eireann

Borehole

BHR35A

Sheet 1 of 2

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by TB Logged by AJ Checked by AG	Start 15/08/2003 End 15/08/2003	Equipment, Methods and Remarks Rotary Open Holed 120mm diameter from 0.00m - 5.60m. Rotary Cored 140mm diameter from 5.60m - 8.60m.	Depth from / to / Diameter / Casing Depth 0.00m / 5.60m / 120mm / 5.60m 5.60m / 8.60m / 90mm	Ground Level +7.49 mOD Coordinates 105 22 Local Grid 83.75

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
	NI NI NI			
5.60-7.10 m	90 74 74			
	240 400 590			
7.10-8.60 m	91 87 87			
		If NI/NI/4	15/08/2003 5.60	

Strata

Description	Depth, Level (Thickness)
MADE GROUND**	(5.60)
Moderately strong coarse grained grey LIMESTONE with heavy Tar/ Hydrocarbon contamination. Fractures extremely closely spaced. (5.60-5.75 m Assumed Zone of Core loss)	5.60 +1.89 (0.35) 5.95 +1.54
Strong to very strong grey coarse grained LIMESTONE. Fractures are closely to medium spaced predominantly subhorizontal planar rough with rare stepped rough fracture. Core shows evidence of contamination with tar smearing on outside of core and evidence of tar within fractures.	(2.55)
Heavily contaminated moderately strong coarse grained grey (stained black) LIMESTONE. Fractures are extremely closely spaced subvertical to subhorizontal. (8.47-8.60 m Assumed Zone of Core Loss)	8.50 -1.01 8.60 -1.11
EXPLORATORY HOLE ENDS AT 8.60 m	

Legend: SP

Backfill/Instruments

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (281), 18/09/2003 12:44:42 AGS

Project Limerick Gas Works

Project No. KC3168

Carried out for Bord Gais Eireann

Borehole **BHR35**

Sheet 1 of 1

For inspection purposes only.
Consent of copyright owner required for any other use.

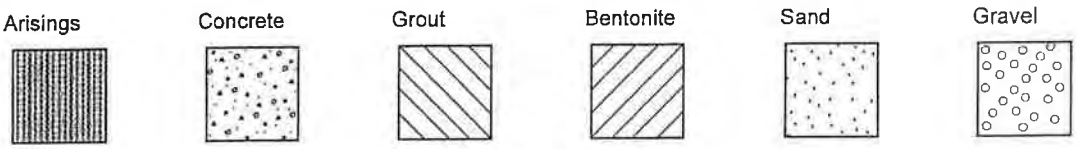
EPA Export 29-05-2012:04:39:00

Key to Exploratory Hole Records

GEOTECH

INSTALLATION LEGENDS

A legend describing the installation is shown in the rightmost column. Legends additional to BS5930 are used to describe the backfill materials as indicated below.



NOTES

1 Strata legends are in accordance with BS 5930 (1999).

2 Water level observations of discernible events during the advancing of the exploratory hole are given at the foot of the log and in the Legend column. The term "none observed" is used where no discrete entries are identified although this does not necessarily indicate that the hole has not been advanced below groundwater level. Under certain conditions groundwater cannot be observed, for instance, drilling with water flush or overwater, or boring at a rate much faster than water can make its way into the borehole (ref BS5930 : 1999, Clause 47.2.7). In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

3 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs, however, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

4 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

5 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

6 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures

For inspection purposes only.
Consent of copyright owner required for any other use.

REFERENCES

BS 1377 : 1990 : British Standard Methods of test for soils for civil engineering purposes. British Standards Institution
BS 5930 : 1999 : Code of Practice for site investigations. British Standards Institution

EPA Export 29-05-2012:04:39:00

Borehole Log

GEOTECH

Drilled by PC	Start 26/07/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+7.31 mOD
Logged by	End 28/07/2003	Inspection Pit from 0.00m - 1.20m. Cable Percussion 200mm diameter from 1.20m - 5.75m.	1.20m	5.75m	200mm		Coordinates	106.25
Checked by AG							Local Grid	83.16

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 1			
1.50-1.95	SPT S	N=4 (1,1/1,1,1,1)		
1.80-2.40	B 2			
2.50-2.95	SPT C	N=8 (1,2/2,2,2,2)		
2.80-3.10	B 3			
3.20-3.65	SPT C	N=18 (1,1/1,1,6,10)		
3.20-3.50	B 4			
4.20-4.50	B 5			
4.50-4.95	SPT C	N=22 (4,4/5,5,6,6)		
5.50-5.65	SPT C	(20,25/25 for 0mm)	28/07/2003	

Strata

Description	Depth,Level (Thickness)	Legend	Backfill/ Instruments
MADE GROUND: Gravelly CLAY with cobbles**	(3.00)		
MADE GROUND: Black silty CLAY**	3.00 +4.31		1
Possible MADE GROUND: Angular COBBLES with black tarry liquid**	(2.00)		1
EXPLORATORY HOLE ENDS AT 5.75 m	5.00 +2.31 (0.75) 5.75 +1.56		

For inspection purposes only. Consent of copyright owner required for any other use.

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	4.00	Rose to 3.10 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
0.00	5.75	Environmental sampling taken as specified by Parkman.

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (281), 18/09/2003 12:55:48

AGS

Project	Limerick Gas Works
Project No.	KC3168
Carried out for	Bord Gais Eireann

Borehole

BH35

Sheet 1 of 1

EPA Export 29-05-2012:04:39:01

Point Load Test Data
Project: Limerick Gas Works
Project No.: KC3168
Test Date: 18-Aug-03

Borehole	Top Depth (mBGL)	Bottom Depth (mBGL)	Rock Description	Test Direction (PL/PD/R)	Core/Lump Diam/Width (mm)	Platen Separation D (initial) (mm)	D (failure) (mm)	Equiv Diam (mm)	Failure Loa (kN)	Is P/De^2 Mpa	Correction Factor $(De/50)^{0.45}$	**Is50 Is x F Mpa**	Remarks
Diametric Tests													
BH36A	3.60	3.74	Light grey limestone	PL	84	84	70	70	35.0	7.1	1.3	**9.0**	
BH36A	4.20	4.26	Light grey limestone	PD	82	82	75	75	19.0	3.4	1.2	**4.2**	
BH36A	4.60	4.84	Light grey limestone	PL	84	84	73	73	39.0	7.3	1.3	**9.2**	
BH36A	6.45	6.95	Light grey limestone	PL	84	84	76	76	39.0	6.8	1.3	**8.5**	
BH36A	7.33	7.43	Light grey limestone	PL	85	85	72	72	44.0	8.5	1.3	**10.8**	
BH38A	4.75	5.40	Light grey limestone	PL	85	85	68	68	37.0	8.0	1.3	**10.2**	
BH38A	5.11	5.70	Light grey limestone	PL	72	72	58	58	28.0	8.3	1.2	**9.8**	
BH38A	7.20	7.45	Light grey limestone	PL	79	79	46	46	12.0	5.7	1.2	**7.0**	
Axial Tests													
BH36A	7.10	7.20	Light grey limestone	PD	45	45	39	47.3	28.0	12.5	1.0	**12.0**	

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:01

ENCLOSURE C

DRAWINGS

For inspection purposes only.
Consent of copyright owner required for any other use.

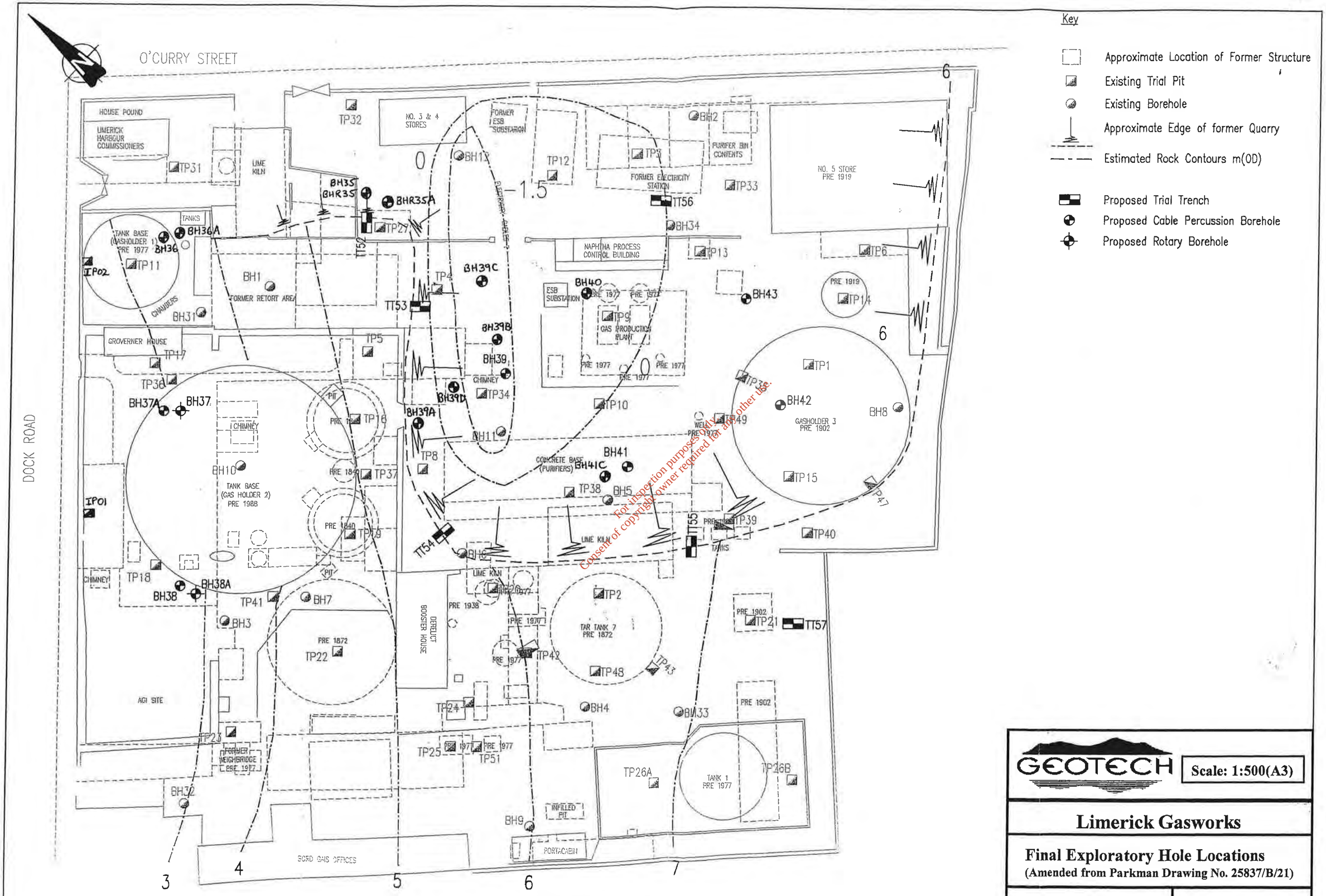
Site Location Plan	C1
Site Plan	C2

EPA Export 29-05-2012:04:39:01

For inspection purposes only.
Consent of copyright owner required for any other use.

Site Location Plan	**Project** Limerick Gas Works, Limerick Parkman	Contract KC3168
GEOTECH		Drawing 1

EPA Export 29-05-2012:04:39:01



For inspection purposes only.
Consent of copyright owner required for any other use.

GEOTECH

Scale: 1:500(A3)

Limerick Gasworks

Final Exploratory Hole Locations
(Amended from Parkman Drawing No. 25837/B/21)

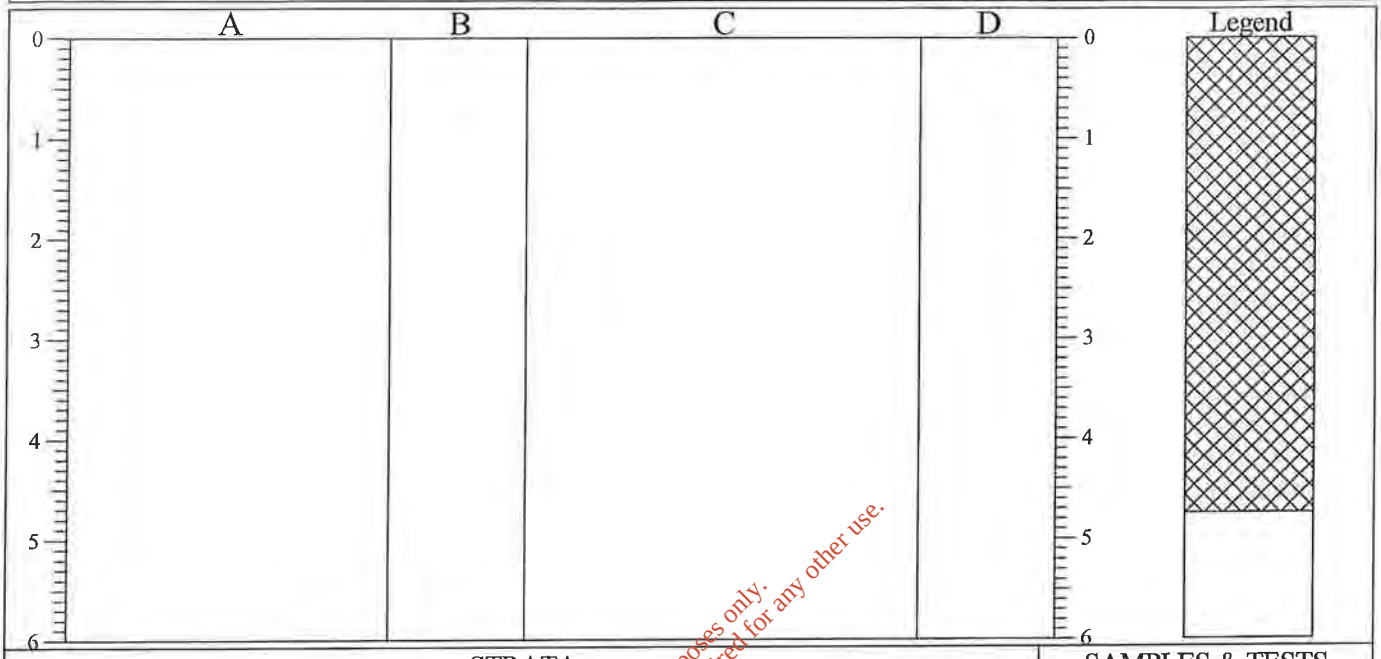
Contract 172134 | Drawing 2

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

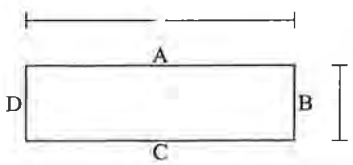
Project				TRIAL PIT No
Limerick Gasworks				TT52
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	28-07-03 28-07-03	11.75		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-4.75 (4.75)		MADE GROUND: ? Soft light brown / grey sandy gravelly clay fill with many cobbles and boulders of limestone	4.00		Earth
		Trial pit excavated within an earth and limestone boulder retaining wall			

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered

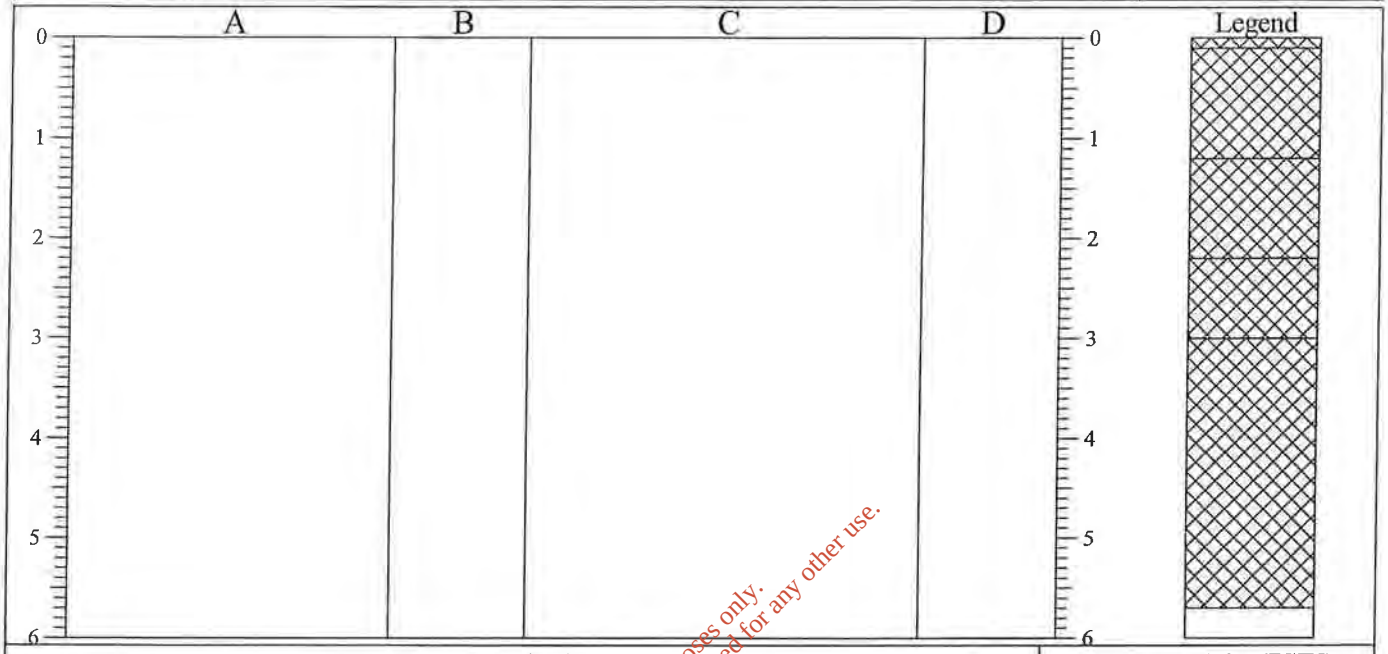
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

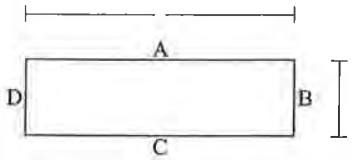
Project				TRIAL PIT No
Limerick Gasworks				TT53
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	26-07-03 26-07-03	7.75		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Concrete			
0.10-1.20 (1.10)		MADE GROUND: ? Loose brown sandy gravel with many cobble sized concrete fragments and pipe fragments. Sand is medium to coarse. Gravel is fine to coarse angular to subrounded.			
1.20-2.20 (1.00)		MADE GROUND: ? Loose tan brown slightly gravelly fine to coarse sand.	1.00	J	
2.20-3.00 (0.80)		MADE GROUND: ? Loose dark grey gravelly fine to coarse sand with some angular coarse cobbles of limestone.	2.00	J	
3.00-5.70 (2.70)		MADE GROUND: ? Soft brown sandy gravelly clay with occasional limestone cobbles. Slight hydrocarbon odour.	4.50	J	
		Pit terminated @ 5.7m			

Shoring/Support:
Stability:



GENERAL REMARKS

Groundwater encountered @ 5.7m
Not enough to sample

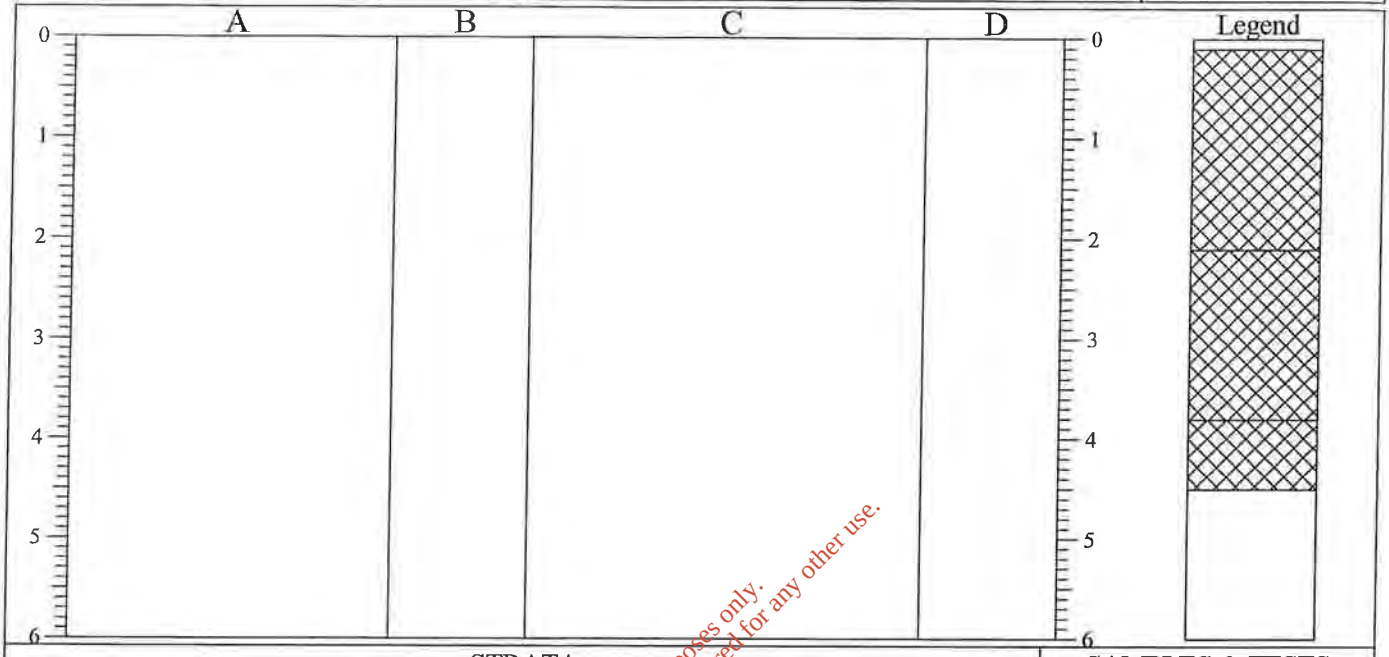
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

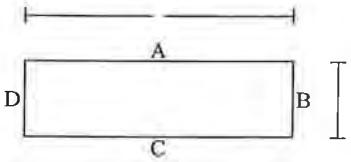
Project				TRIAL PIT No
Limerick Gasworks				TT54
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	28-07-03 28-07-03	7.75		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		? Loose brown sandy topsoil			
0.10-2.10 (2.00)		MADE GROUND: ? Loose / medium dense brown samdy gravel with many concrete blocks, whole and fragmented brick, insitu pipes and brick structures. Gravel is fine to coarse angular to subrounded.	0.50	J	
2.10-3.80 (1.70)		MADE GROUND: ? Soft grey (with dark grey patches) sandy gravelly clay. Gravel is fine to coarse angular to rounded limestone, concrete and slag.	2.30	J	
3.80-4.50 (0.70)		MADE GROUND: ? Loose dark grey / black medium to coarse angular gravel of ash.	3.80	W	
			4.20	J	
		Pit terminated @ 4.5m			

Shoring/Support:
Stability:



GENERAL REMARKS

Groundwater encountered @ 3.8m

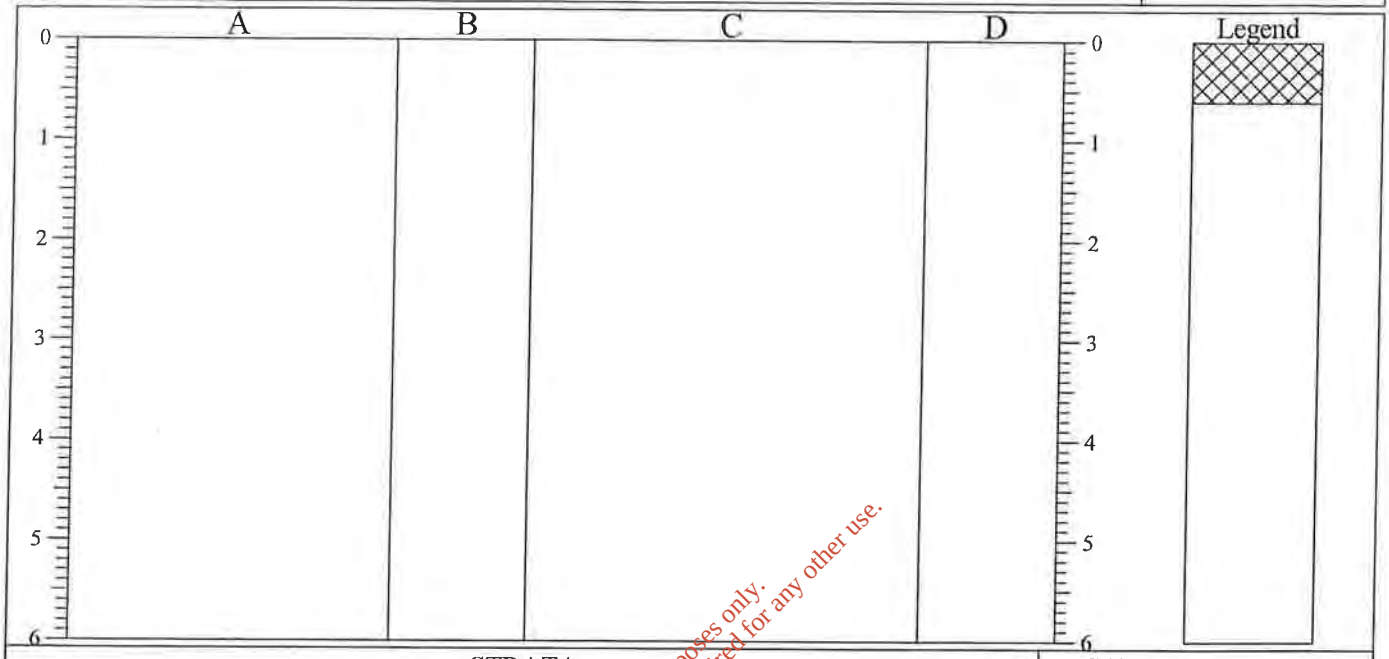
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

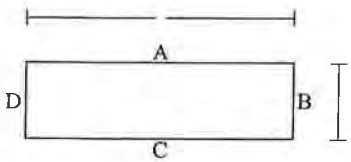
Project				TRIAL PIT No
Limerick Gasworks				TT54E
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	28-07-03 28-07-03	8.80		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60 (0.60)		MADE GROUND: ? Medium dense brown / black gravelly sand with many cobbles of limestone and some of concrete. Gravel is fine to coarse subangular to subrounded of limestone and concrete. Tarry odour and back staining present within fill material.			
		Pit terminated @ 0.6m - edge of quarry proven	0.60	J	
		Limestone outcrop @ 0m within TP approximately 0.5m from Face C. Line of the outcrop represents edge of former quarry and is in line with limestone block wall and wall of derelict booster house.			

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered

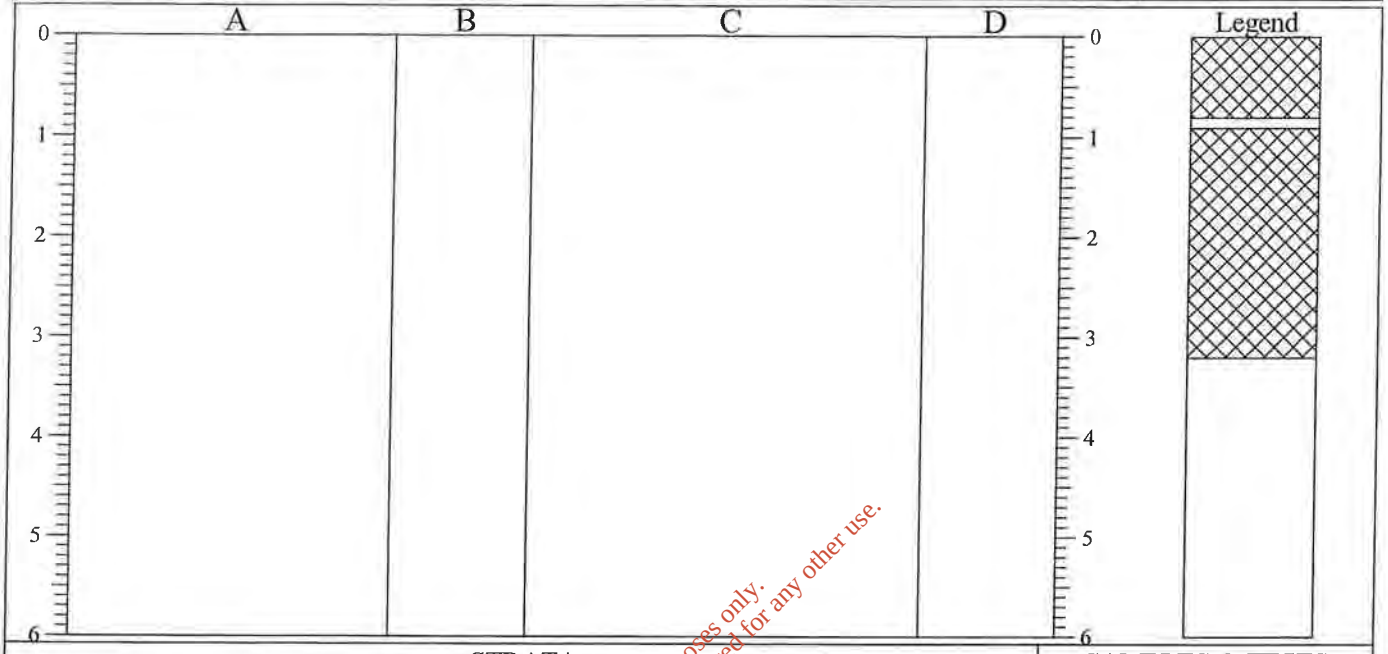
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By V. Sankey

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

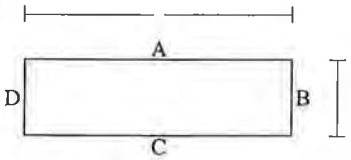
Project				TRIAL PIT No
Limerick Gasworks				TT55
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	26-07-03 26-07-03	7.08		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80 (0.80)		MADE GROUND: ? Loose brown slightly clayey fine to coarse gravel with much cobble to boulder sized concrete fragments. Gravel is fine to coarse angular to subrounded.			
0.80-0.90		MADE GROUND: Mass concrete	0.60	J	
0.90-3.20 (2.30)		MADE GROUND: ? Loose dark brown sandy medium to coarse angular to subrounded gravel of limestone and concrete. Very tarry with heavy hydrocarbon staining.	2.00	J	
			3.00	J	
		Pit terminated @ 3.2m - obstruction (possibly rockhead)	3.20	W	

Shoring/Support:
Stability:



GENERAL REMARKS

Tarry water encountered
Standing @ 3.2m

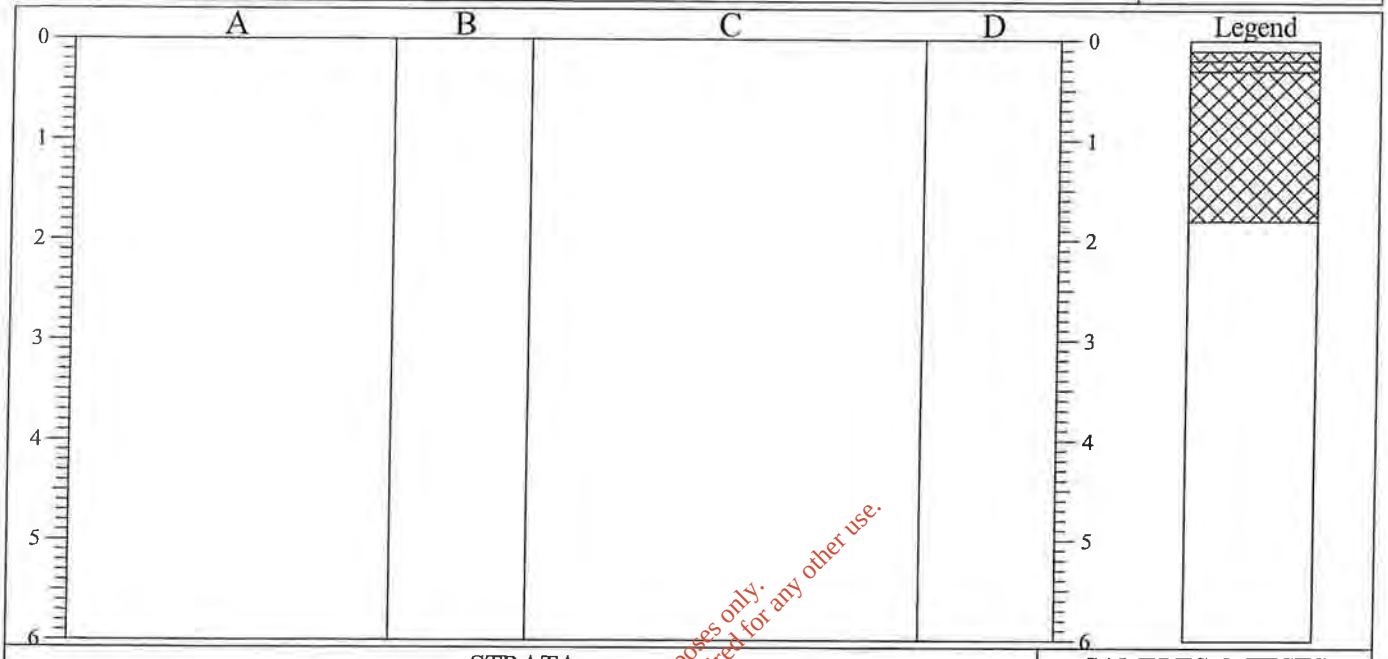
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

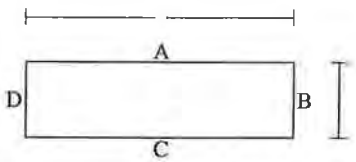
Project				TRIAL PIT No
Limerick Gasworks				TT56
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	28-07-03 28-07-03	6.25		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		(Grass and shrubs over) Topsoil			
0.10-0.20		MADE GROUND: Concrete			
0.20-0.30		MADE GROUND: Brick floor	0.30	J	
0.30-1.80 (1.50)		MADE GROUND: ? Medium dense brown gravelly sand with much brick and concrete, and rare limestone, metal, timber, pipes and small lumps of clay. Gravel is fine to coarse angular to subrounded of brick, concrete and limestone. Brick structure present in Faces C and D with tarry material below bricks in Face D.	1.30	J	
		Pit terminated @ 1.8m - obstruction (brick floor) in base of pit	1.75	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Slight seepage @1.75m

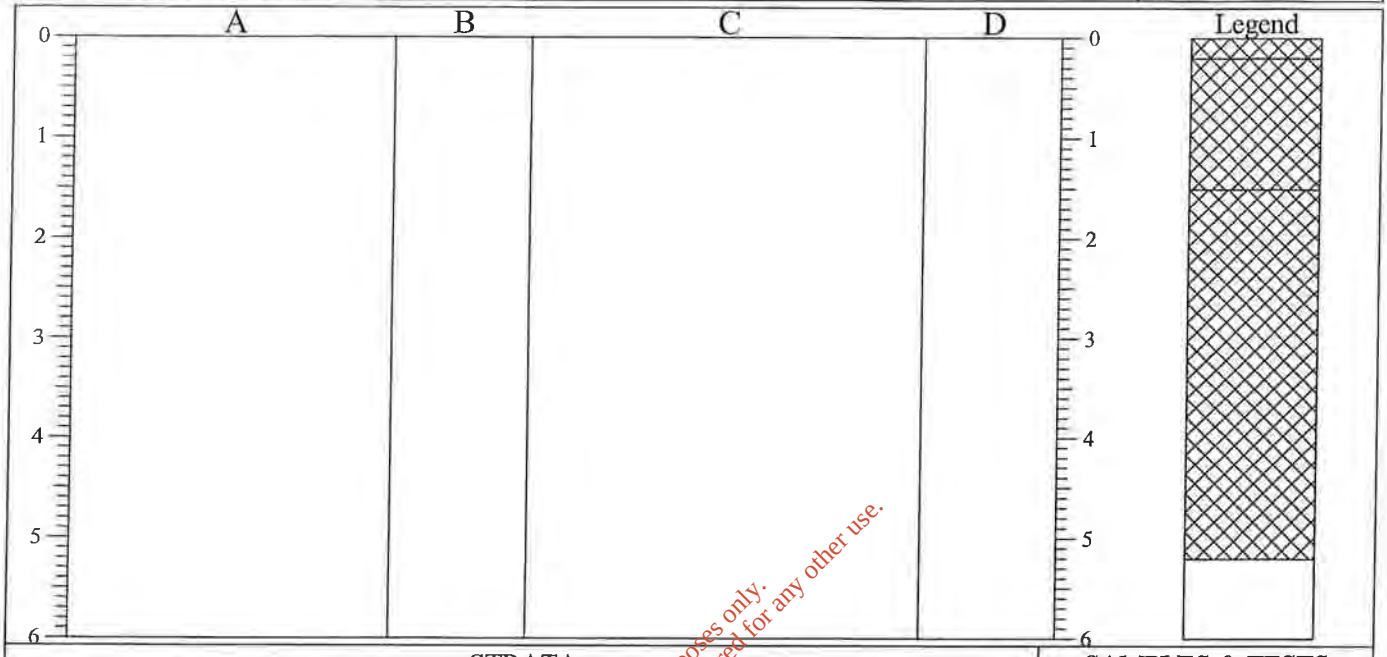
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By V. Sankey

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

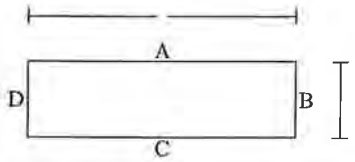
Project				TRIAL PIT No
Limerick Gasworks				TT57
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	26-07-03 26-07-03	7.67		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: ? Loose dark grey sandy angular to subrounded limestone gravel hardcore with some domestic refuse at base.			
0.20-1.50 (1.30)		MADE GROUND: ? Loose / medium dense fine to coarse sand with much brick rubble including brick and concrete foundations.	1.00	J	
1.50-5.20 (3.70)		MADE GROUND: ? Soft grey sandy gravelly clay with many angular to subangular limestone cobbles.	2.00 4.00	J J	
		Pit terminated @ 5.2m - maximum reach of excavator			

Shoring/Support:
Stability:



GENERAL REMARKS

No groundwater encountered

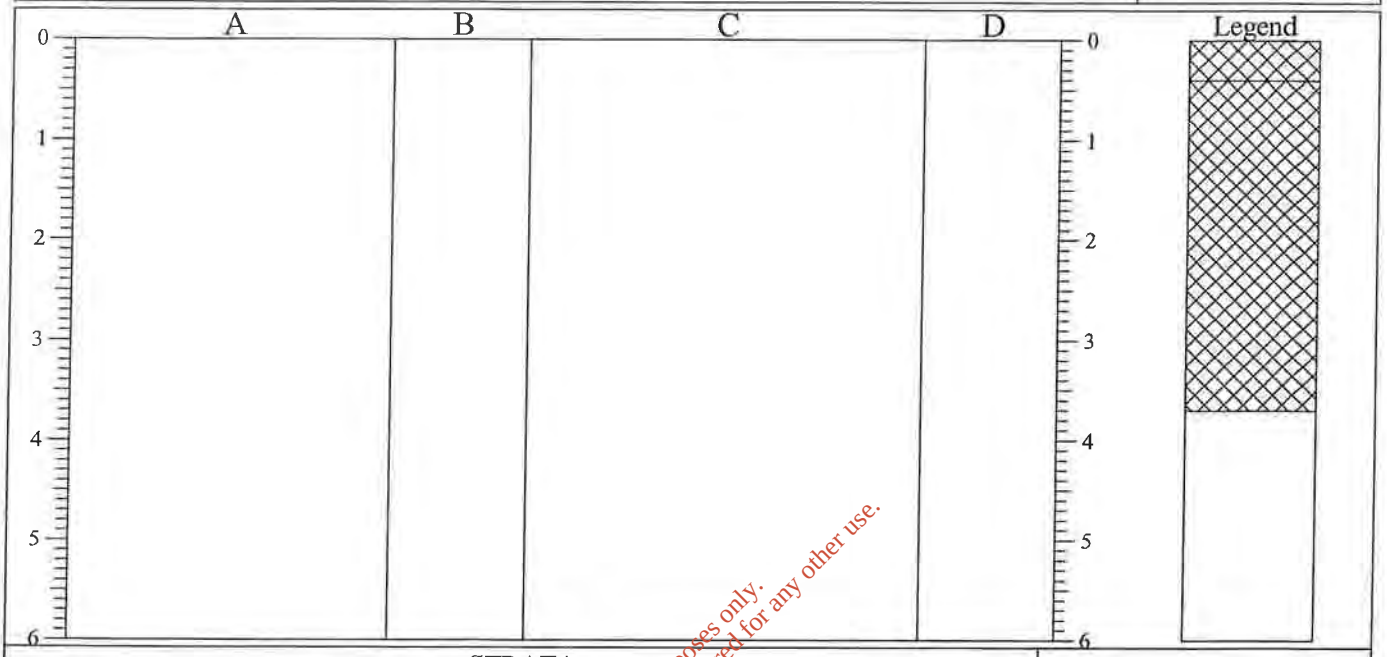
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

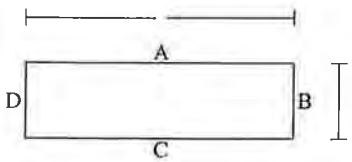
Project				TRIAL PIT No
Limerick Gasworks				TT58
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	26-07-03 26-07-03	7.95		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		MADE GROUND: ? Loose brown gravelly fine to coarse sand with some large angular cobbles and boulders of limestone and concrete			
0.40-3.70		MADE GROUND: ? Loose tan brown slightly gravelly fine to coarse sand			
			1.00	J	
(3.30)			2.00	J	
			3.00	W	
		Pit terminated @ 3.7m - water obscuring base of pit			

Shoring/Support:
Stability:



GENERAL REMARKS

Standing water @ 3.0m

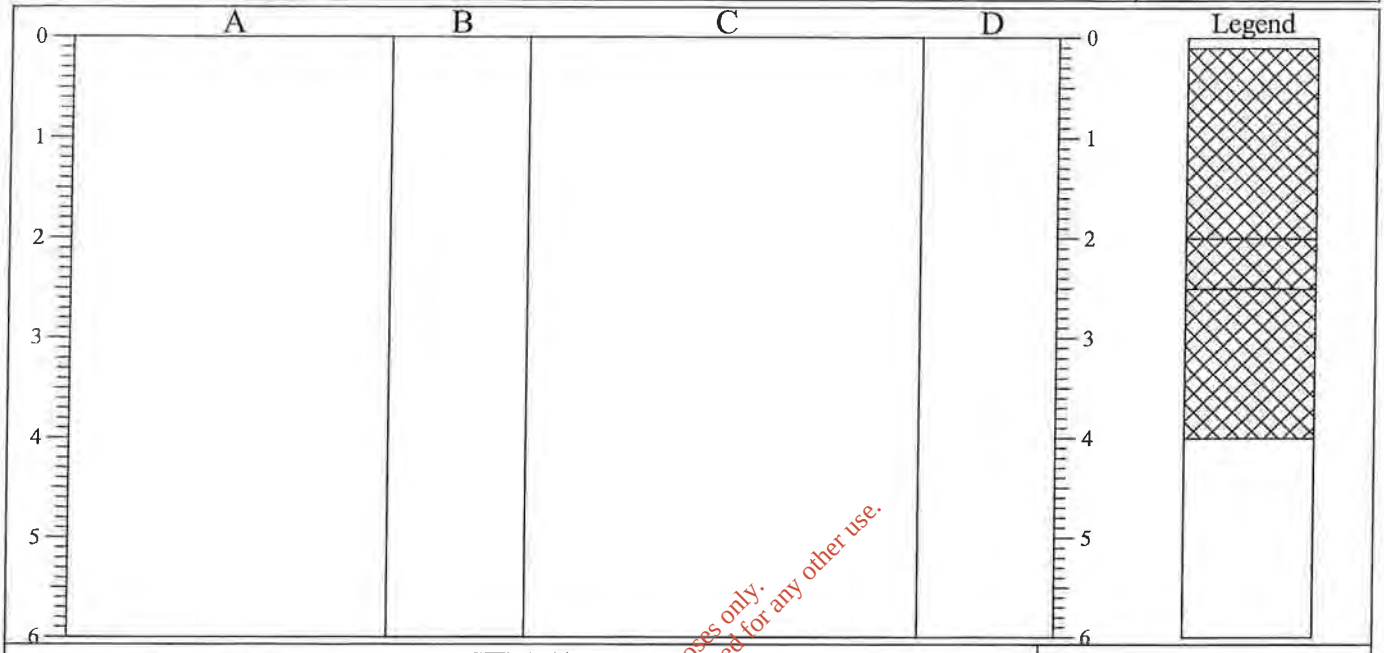
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

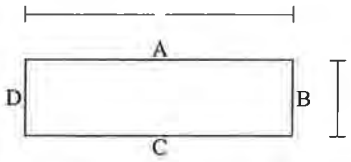
Project				TRIAL PIT No
Limerick Gasworks				TT59
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	26-07-03 26-07-03	8.05		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		(Grass over) Topsoil			
0.10-2.00 (1.90)		MADE GROUND: ? Loose / medium dense brown slightly clayey sandy fine to coarse angular to rounded gravel with many cobbles and boulders of concrete and much whole and fragmented brick.	1.30	J	
2.00-2.50 (0.50)		MADE GROUND: ? Loose brown slightly gravelly fine to coarse sand with many cobbles of limestone.	2.30	J	
2.50-4.00 (1.50)		MADE GROUND: ? Dense angular cobbles and boulders of limestone.	3.40	W	
		Pit terminated @ approximately 4m - water obscuring base of pit			

Shoring/Support:
Stability:



GENERAL REMARKS

Water standing @ 3.4m

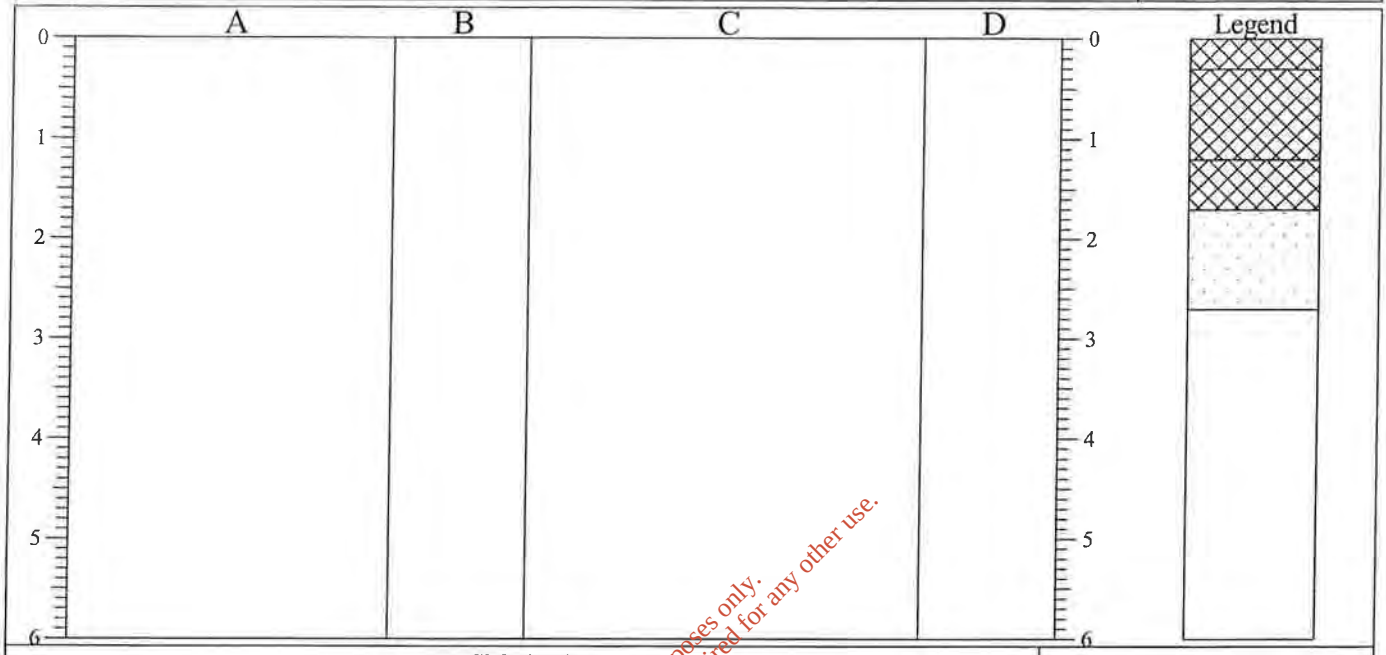
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

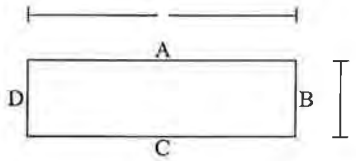
Project				TRIAL PIT No
Limerick Gasworks				TT100
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	11-08-03 11-08-03	7.15		
Contractor				Sheet
Geotech Specialists				1 of 1



Consent of copyright owner required for any other use.
For inspection purposes only.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Concrete (reinforced)			
0.30-1.20 (0.90)		Made Ground: Concrete (mass) over loose brown sandy coarse to angular gravel hardcore fill between dense brown sandy angular cobbles / boulders of limestone. Slight odour of purifiers, strong initially.			
1.20-1.70 (0.50)		Made Ground: Loose brown clayey medium to coarse sand with some fine to coarse angular to subrounded gravel with hydrocarbon odour.	1.40	JS1	
1.70-2.70 (1.00)		Loose white / light grey fine to coarse sand - limey appearance, hydrocarbon odour	2.20	JS2	
		TP terminated @ 2.7m; water obscuring base of pit and unstable sides			

Shoring/Support:
Stability:Unstable sides



GENERAL REMARKS

Water standing @ 2.6m; grey with hydrocarbon sheen

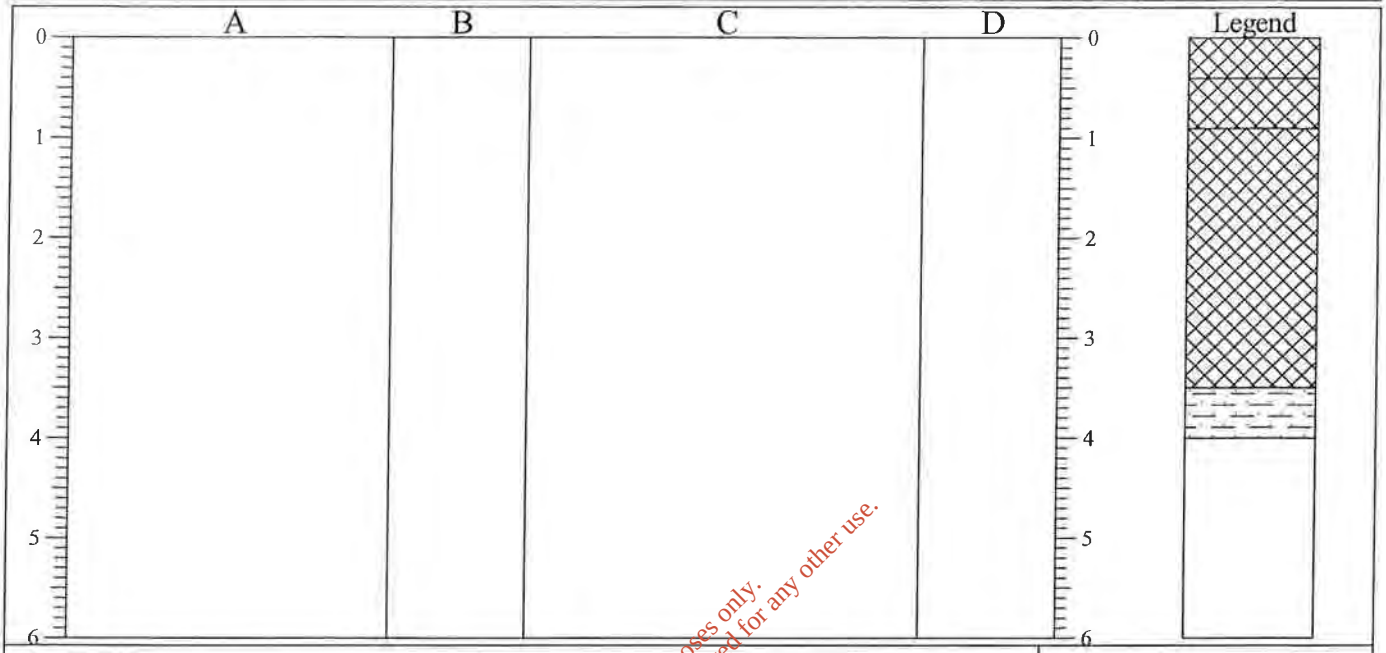
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

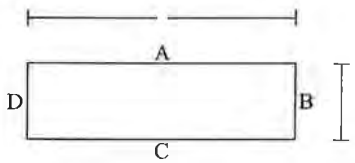
Project				TRIAL PIT No
Limerick Gasworks				TT101
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	09-08-03 11-08-03	7.10		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Concrete			
0.40-0.90 (0.50)		Made Ground: Loose brown coarse sand with much brick and angular to subangular gravel and cobbles of concrete.			
0.90-3.50		Made Ground: Concrete and brick layers. Bricks are stained black with slight hydrocarbon odour in places; with depth (below 2.7m) becoming dark 'old' concrete with H2S odour. Timber is also present within the concrete.	0.80	JS1	
(2.60)					
		Water present @ 2.7m, dark with H2S odour and hydrocarbon sheen	2.70	JS2	
3.50-4.00 (0.50)		Soft grey / dark grey sandy clay with some wood fragments.	3.70	JS3	
		TP terminated @ 4.0m; water obscuring base of pit			

Shoring/Support:
Stability: Stable



GENERAL REMARKS

Water standing @ 2.5m after 20 minutes

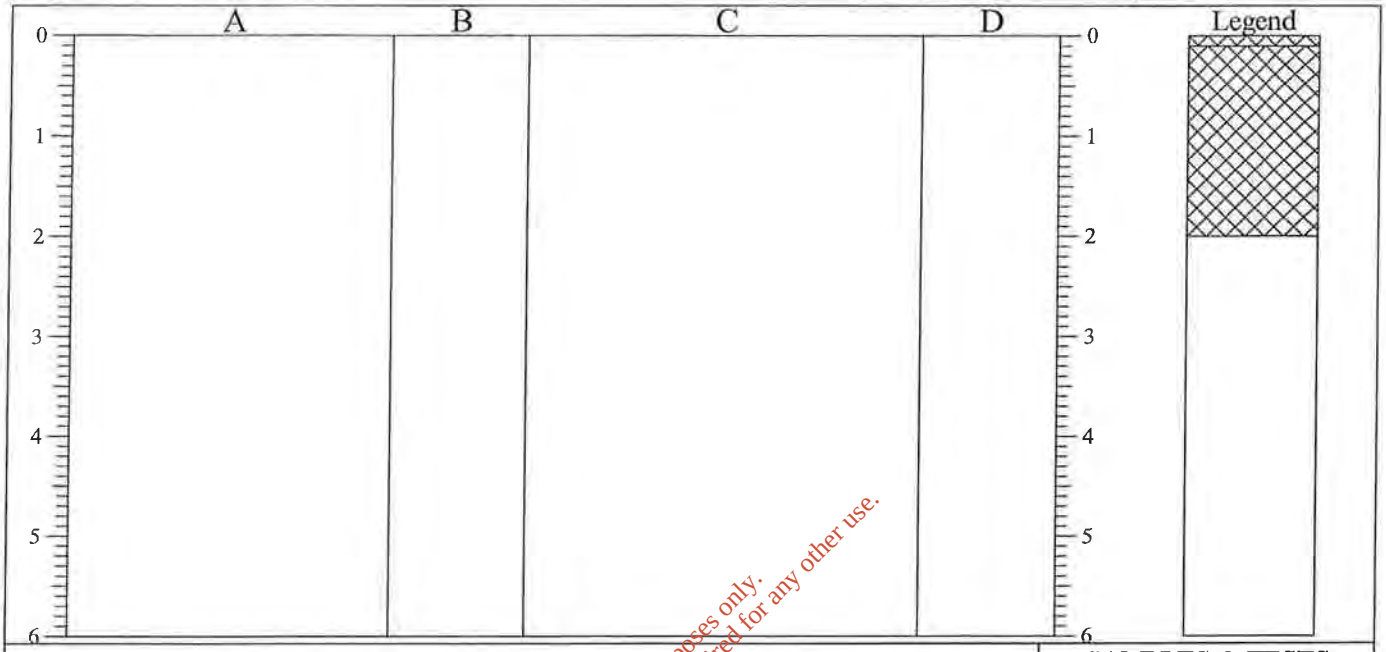
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

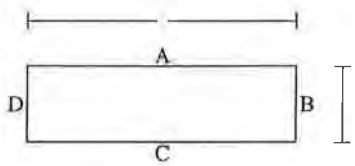
Project				TRIAL PIT No
Limerick Gasworks				TT102
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	28-07-03 28-07-03	7.67		
Contractor				Sheet
Geotech Specialists				1 of 1



STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10 0.10-2.00 (1.90)		MADE GROUND: ?Medium dense dark brown / black slightly sandy gravel with much stone. Gravel is fine to coarse subangular to subrounded. MADE GROUND: ?Medium dense brown / black sandy gravel with much brick and stone, and rare pipe, metal cables and concrete. Gravel is fine to coarse subangular to subrounded. Tarry material with hydrocarbon odour present within fill at base of trial pit.	2.00	J	

For inspection purposes only.
Consent of copyright owner required for any other use.

Shoring/Support:
Stability:



GENERAL REMARKS

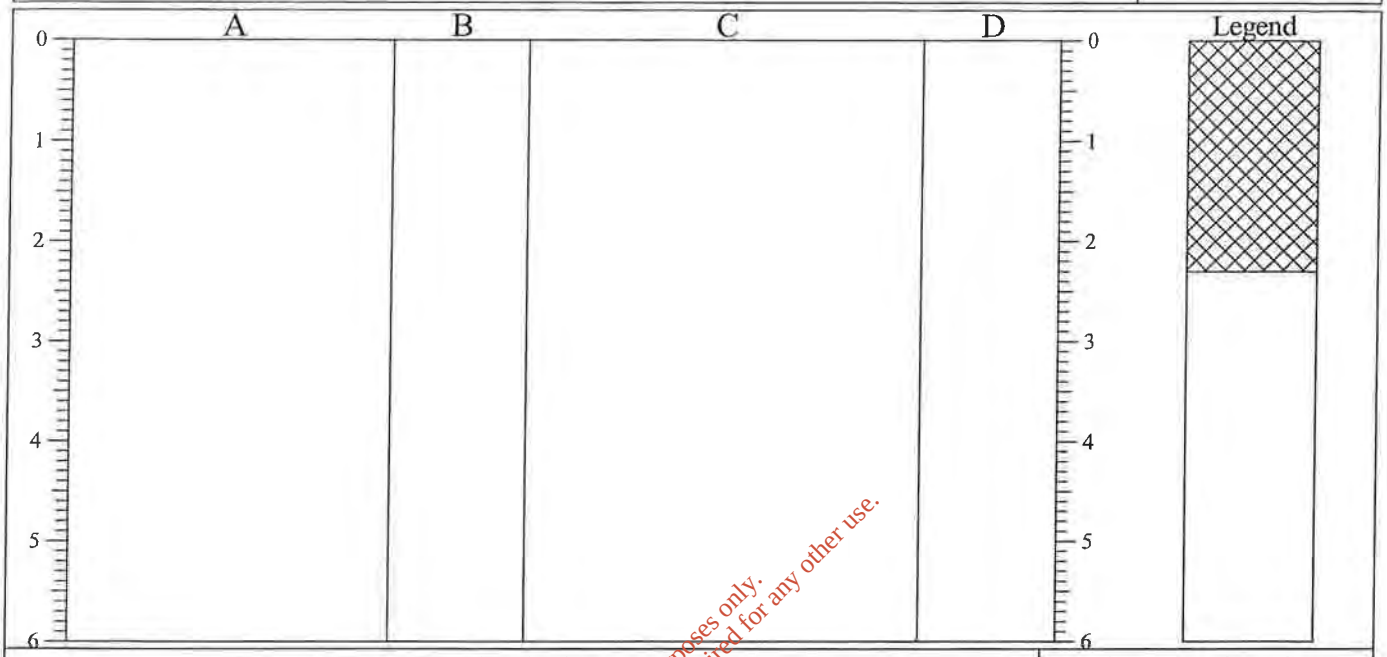
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By V. Sankey

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

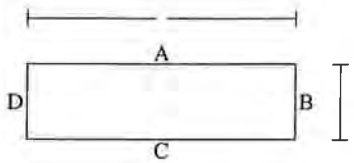
Project				TRIAL PIT No
Limerick Gasworks				TT102A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	11-08-03 11-08-03	7.65		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-2.30 (2.30)		Made Ground: Loose brown / tan brown sandy fine to coarse angular to subrounded gravel of limestone, concrete, brick, old plastic gas pipes, bund tape with cobbles and boulders of concrete and limestone. Some timber is also present at depth. Concrete @ 1.4m; represents original floor level Water draining slowly from old water pipe @ 1.8m Timber @ 2.2m			

Shoring/Support:
Stability:



GENERAL REMARKS

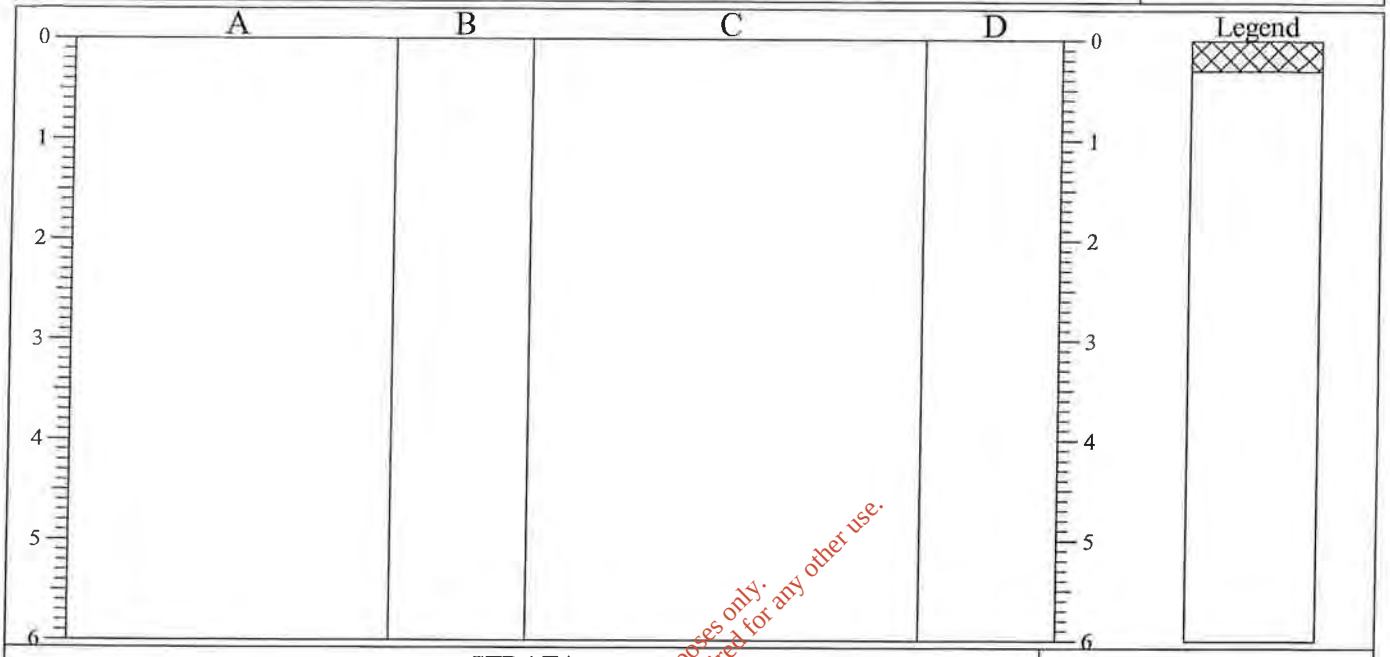
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

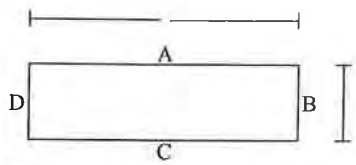
Project				TRIAL PIT No
Limerick Gasworks				TT103
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	11-08-03 11-08-03	6.25		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Made Ground: Loose brown slightly clayey sandy fine to coarse angular to subrounded gravel of limestone, brick and concrete.			

Shoring/Support:
Stability:



GENERAL REMARKS

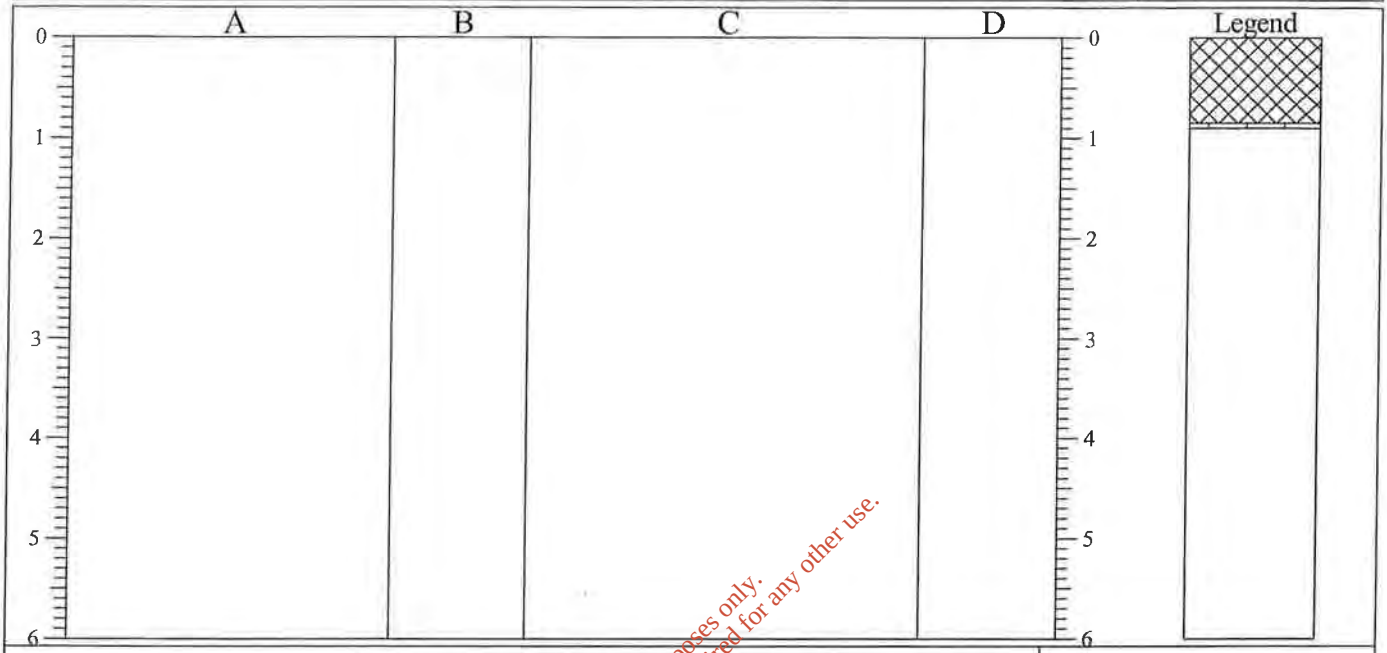
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

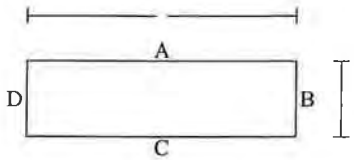
Project				TRIAL PIT No
Limerick Gasworks				IP04
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	11-08-03 11-08-03			
Contractor				Sheet
Geotech Specialists				1 of 1



STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.85 (0.85)		Made Ground: Loose brown / dark grey tarry sandy fine to coarse angular to subangular of ash, some coarse concrete cobbles. In places, gravel is bound by tar.	0.40	JS1	
0.85-0.90		?Possible Limestone bedrock?			
		TP terminated @ 0.85m; possible rockhead			

For inspection purposes only.
Consent of copyright owner required for any other use.

Shoring/Support:
Stability:



GENERAL REMARKS

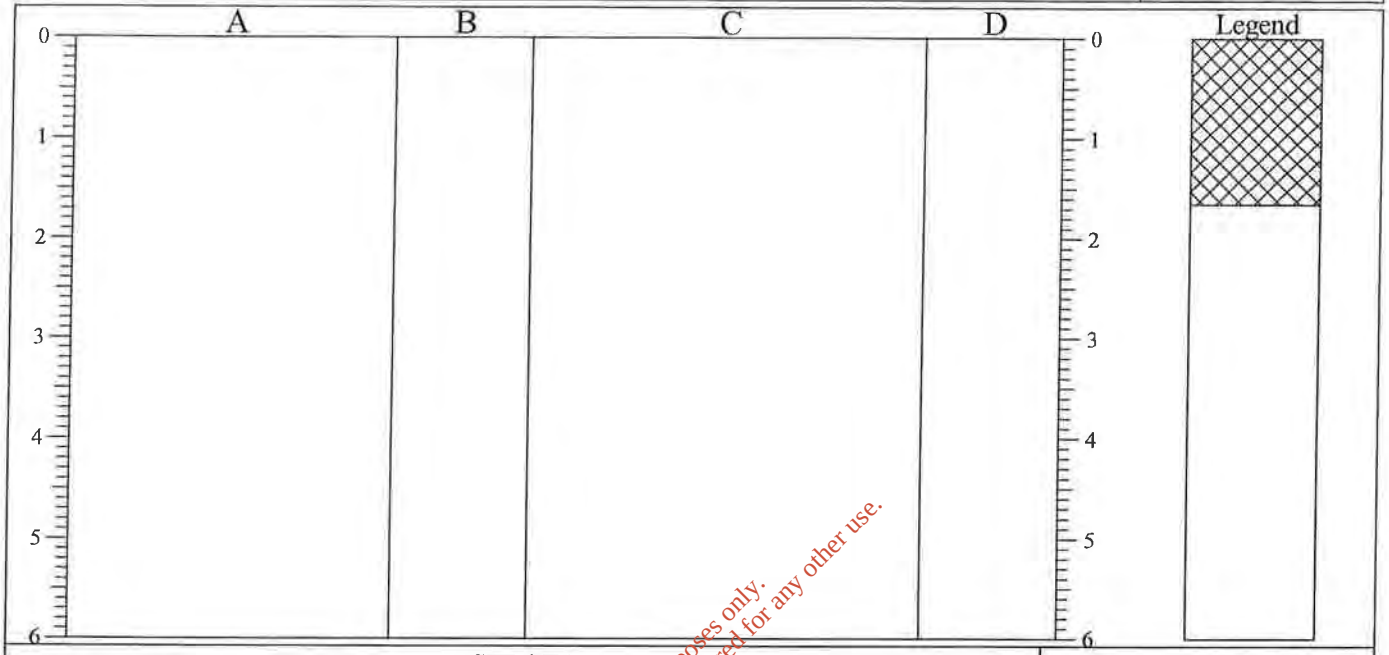
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

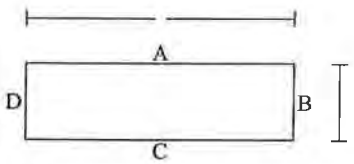
Project				TRIAL PIT No
Limerick Gasworks				IP03
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	11-08-03 11-08-03	6.20		
Contractor				Sheet
Geotech Specialists				1 of 1



STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.65 (1.65)		Made Ground: Loose brown sand with mch domestic refuse, car battery, metal, wood, concrete blocks, limestone blocks, glass jars, pottery, plastic tyres and glass fragments.			
		TP terminated @ 1.65m; sides unstable and pipe obstructing progress			

For inspection purposes only.
Consent of copyright owner required for any other use.

Shoring/Support:
Stability: Unstable sides



GENERAL REMARKS

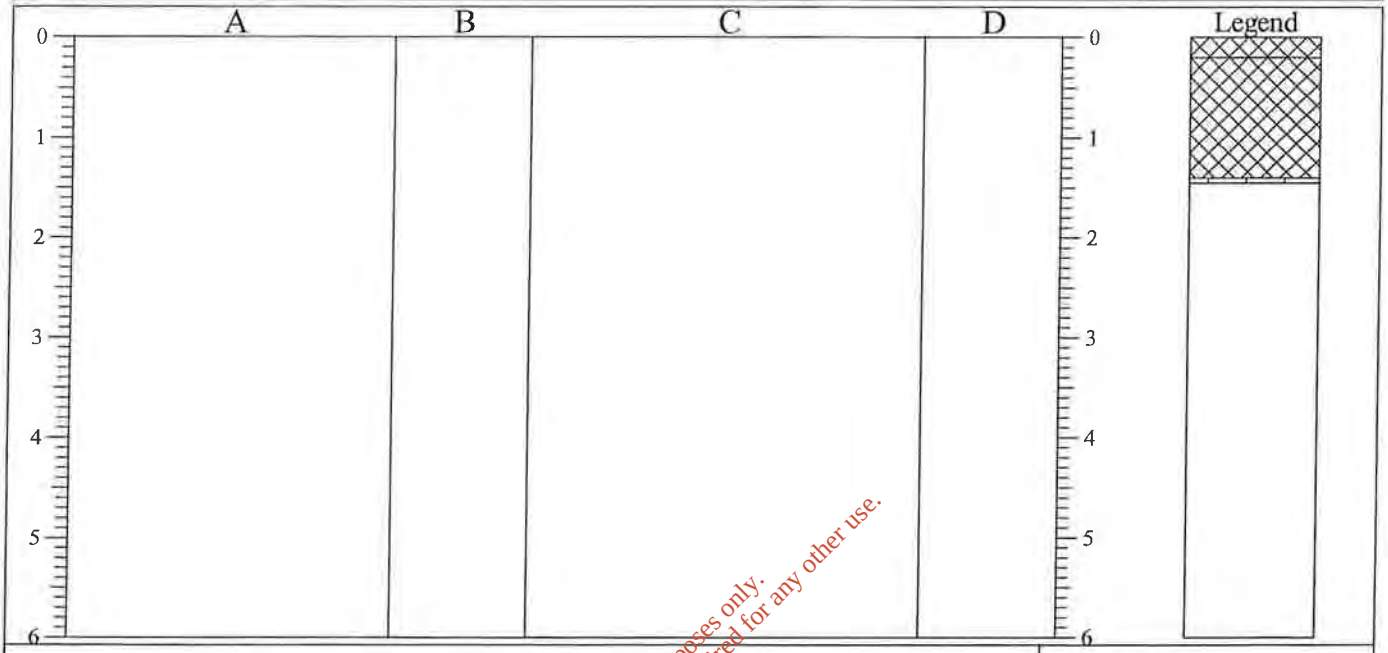
All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

Parkman Ltd
Lloyd Drive
CH65 9HQ
Telephone: 0151 356 5555
Fax: 0151 356 4225

TRIAL PIT LOG

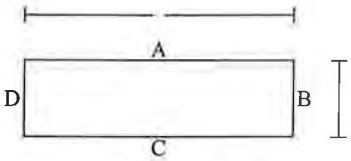
Project				TRIAL PIT No
Limerick Gasworks				IP05
Job No	Date	Ground Level (m)	Co-Ordinates ()	
0025837	11-08-03 11-08-03	6.30		
Contractor				Sheet
Geotech Specialists				1 of 1



For inspection purposes only.
Consent of copyright owner required for any other use.

STRATA			SAMPLES & TESTS		
Depth (Thickness)	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Concrete			
0.20-1.40		Made Ground: Brick rubble fill			
(1.20)					
1.40-1.45		?Possible Limestone bedrock?			
		TP terminated due to presence of obstruction - possible rockhead			

Shoring/Support:
Stability:



GENERAL REMARKS

All dimensions in metres Scale 1:75	Client Bord Gais	Method/ Plant Used	Logged By O. Kelly

EPA Export 29-05-2012:04:39:01

For inspection purposes only.
Consent of copyright owner required for any other use.

Soil Chemical Results

Master Copy

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	TT 55 0.60	TT 55 2.00	TT 56 0.30	TT 56 1.75	TT 57 1.00	TT 57 4.00	TT 58 1.00	TT 58 2.00	TT 59 1.30
pH	pH Units	7.24	7.78	6.30	8.23	7.39	6.90	8.28	8.79	7.05
% Loss on Ignition	%	12.0	11.0	5.0	6.0	8.0	2.0	10.0	9.0	12.0
% Moisture Content	%	17.5	34.2	9.2	12.5	13.5	12.2	26.2	23.8	8.6
% Stones	%	51.5	11.3	34.9	41.9	26.7	8.2	13.2	16.3	35.4
Cresols	mg/kg	<0.01	32.59	0.01	0.01	0.01	0.12	0.06	<0.01	0.22
Xylenols & Ethylphenols	mg/kg	<0.01	<0.01	<0.01	0.02	<0.01	0.04	<0.01	<0.01	0.02
Naphthols	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/kg	<0.01	5.16	<0.01	<0.01	0.01	0.04	0.03	<0.01	0.09
Trimethylphenol	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/kg	<0.01	37.75	0.01	0.04	0.02	0.21	0.08	<0.01	0.5
Naphthalene	mg/kg	29.182	3651.266	0.26	2.357	1.632	0.033	49.974	1.249	32.978
Acenaphthylene	mg/kg	10.521	239.141	0.523	4.868	1.362	0.029	4.807	0.696	27.831
Acenaphthene	mg/kg	15.201	759.413	0.073	0.958	0.261	0.008	0.644	0.705	5.868
Fluorene	mg/kg	21.831	922.376	0.301	2.204	0.674	0.011	2.742	0.668	20.671
Phenanthrene	mg/kg	76.964	2519.719	0.951	7.852	5.723	0.097	6.892	2.705	63.236
Anthracene	mg/kg	29.733	1113.534	0.406	3.639	2.308	0.072	2.463	1.018	22.819
Fluoranthene	mg/kg	94.365	1252.986	1.436	13.65	13.244	0.105	4.466	6.705	71.778
Pyrene	mg/kg	57.94	829.242	1.248	12.232	10.412	0.095	3.346	5.42	50.715
Cyclopenta(cd)pyrene	mg/kg	0.747	41.021	0.426	2.105	2.196	0.029	0.539	1.041	8.335
Benzo(a)anthracene	mg/kg	48.208	447.044	1.411	6.496	7.367	0.098	1.806	3.865	28.475
Chrysene	mg/kg	31.741	441.532	1.435	6.679	6.473	0.098	2.182	3.986	25.469
Benzo(b)fluoranthene	mg/kg	70.757	612.423	2	11.211	11.8	0.113	2.916	9.506	45.248
Benzo(k)fluoranthene	mg/kg	14.595	104.902	1.065	4.521	3.589	0.057	0.961	2.308	14.107
Benzo(e)pyrene	mg/kg	20.534	187.257	1.216	6.321	5.298	0.075	1.665	4.44	18.243
Benzo(a)pyrene	mg/kg	31.077	306.311	1.319	4.421	6.087	0.076	1.285	4.604	21.08
Indeno(1/2/3-cd)pyrene	mg/kg	16.025	140.816	1.534	7.452	6.237	0.098	2.64	5.952	21.72
Di-benz(a/h)anthracene	mg/kg	4.294	38.268	0.381	2.051	1.696	<0.001	0.73	1.308	5.185
Benzo(g/h/l)perylene	mg/kg	17.036	152.554	1.855	8.616	6.643	0.096	2.889	6.419	23.635
Anthanthrene	mg/kg	7.635	87.515	0.255	0.754	2.328	<0.001	0.673	1.102	4.977
Total PAH	mg/kg	598.387	13647.318	18.095	108.39	95.329	1.191	93.619	63.696	512.372
Easily-liberatable Cyanide	mg/kg	2.47	1.20	<1	<1	<1	<1	1.02	2.39	1.78
Complex Cyanide	mg/kg	280.8	2042.2	4.1	10.8	<2.5	19.0	106.5	114.3	115.8
Total Cyanide	mg/kg	283.3	2043.4	4.1	10.75	<2.5	19.02	107.5	116.7	117.6
Elemental Sulphur	mg/kg	3036	<50	<50	211	<50	<50	<50	196	72
Exchangeable Ammonium	mg/kg	10.3	48.1	2.3	6.8	3.2	13.3	10.0	4.3	33.2
Arsenic	mg/kg	8	<1	3	54	41	49	16	38	85
Cadmium	mg/kg	4	4	<1	5	3	4	1	2	<1
Chromium	mg/kg	79	92	146	48	117	136	100	56	115
Lead	mg/kg	1632	434	727	674	905	1101	496	1522	130
Mercury	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	mg/kg	644	28	178	152	159	217	102	128	70
Nickel	mg/kg	111	40	254	242	77	90	55	83	213
Zinc	mg/kg	1637	840	424	1116	1017	1275	423	1008	350
Boron	mg/kg	<1	<1	<1	<1	1	<1	<1	2	<1
Benzene	mg/kg	0.008	111.645	<0.001	0.022	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/kg	0.019	401.893	<0.001	0.03	<0.001	<0.001	<0.001	<0.001	0.002
Ethylbenzene	mg/kg	0.03	89.473	<0.001	0.017	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene	mg/kg	0.256	710.823	<0.001	0.084	<0.001	<0.001	<0.001	<0.001	0.006
2-Isopropyl Phenol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzene by GC	mg/kg	-	38.959	-	-	-	<0.01	-	-	-
Ethylbenzene by GC	mg/kg	-	28.685	-	-	-	<0.01	-	-	-
Toluene by GC	mg/kg	-	149.254	-	-	-	<0.01	-	-	-
Xylene by GC	mg/kg	-	182.698	-	-	-	<0.01	-	-	-
Chloride	mg/kg	170	130	20	50	40	85	30	545	475
Sulphate Soluble as SO4	mg/kg	5100	850	5395	7440	935	28	1190	1740	6595
MTBE by GC	mg/kg	-	0.445	-	-	-	<0.01	-	-	-
Total TPH	mg/kg	5128	26907	473	855	670	339	58	41	1261

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	TT 101 2.70	TT 101 3.80	TT 102 2.00	TT 104 1.20	TT 52 EARTH	TT 53 1.00	TT 53 4.50	TT 54 0.50	TT 54 4.20	TT 54 E 0.60
pH	pH Units	7.52	8.20	8.13	7.73	7.48	7.54	7.86	7.18	6.00	8.46
% Loss on Ignition	%	12.0	3.0	4.0	7.0	1.0	9.0	4.0	39.0	17.0	16.0
% Moisture Content	%	14.6	12.7	14.7	13.7	8.4	21.9	37.9	19.4	27.5	13.1
% Stones	%	47.7	<0.1	5.0	19.0	28.8	20.4	<0.1	27.9	34.8	25.1
Cresols	mg/kg	0.02	0.14	0.02	0.46	<0.01	2.27	0.01	0.64	0.82	1.74
Xylenols & Ethylphenols	mg/kg	0.22	0.24	0.03	<0.01	<0.01	2.29	<0.01	1.5	1.14	4.65
Naphthols	mg/kg	0.02	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
Phenol	mg/kg	0.01	0.04	0.01	0.75	<0.01	0.64	<0.01	0.13	0.68	0.88
Trimethylphenol	mg/kg	0.2	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	0.35
Total Phenols	mg/kg	0.47	0.47	0.1	1.28	<0.01	5.19	0.01	2.48	2.89	10.1
Naphthalene	mg/kg	74.271	12.304	26.188	0.509	0.51	25.35	4.689	127.279	8.39	1249.912
Acenaphthylene	mg/kg	4.298	0.484	19.043	2.686	0.187	13.43	0.658	23.42	1.374	375.939
Acenaphthene	mg/kg	9.285	1.8	5.657	0.161	0.043	2.883	0.565	15.9	4.109	155.361
Fluorene	mg/kg	11.543	2.249	21.301	0.818	0.122	16.577	1.527	54.842	3.681	435.693
Phenanthrene	mg/kg	60.144	7.42	57.025	6.126	0.351	167.512	7.965	352.204	31.808	1036.478
Anthracene	mg/kg	10.637	2.078	9.357	8.438	0.128	55.068	2.691	89.242	9.25	334.663
Fluoranthene	mg/kg	70.145	5.507	8.656	11.921	0.363	157.269	7.799	312.509	81.974	678.309
Pyrene	mg/kg	49.932	3.976	12.328	13.991	0.312	114.899	5.662	352.486	72.696	402.853
Cyclopenta(cd)pyrene	mg/kg	7.91	<0.001	0.626	2.893	0.058	3.867	0.322	28.508	14.704	81.054
Benzo(a)anthracene	mg/kg	37.412	1.808	1.353	6.635	0.149	97.01	4.703	114.266	58.769	248.18
Chrysene	mg/kg	41.789	1.662	2.063	6.669	0.146	62.216	3.1	115.988	57.59	193.98
Benzo(b)fluoranthene	mg/kg	101.982	3.194	1.597	8.024	0.132	99.397	6.114	110.149	83.64	232.88
Benzo(k)fluoranthene	mg/kg	17.059	0.999	0.349	3.354	0.069	21.059	1.133	36.557	32.341	70.656
Benzo(e)pyrene	mg/kg	36.584	1.384	0.95	5.498	0.087	39.493	1.893	56.969	49.829	109.388
Benzo(a)pyrene	mg/kg	39.318	2.25	0.889	6.241	0.081	58.691	2.761	61.951	63.876	145.136
Indeno(1/2/3-cd)pyrene	mg/kg	27.249	1.437	0.623	5.437	0.135	29.212	1.053	47.356	74.337	106.022
Di-benz(a/h)anthracene	mg/kg	10.285	0.436	0.179	1.511	0.04	7.055	0.329	12.346	19.977	33.637
Benzo(g/h/i)perylene	mg/kg	27.636	1.631	1.093	6.874	0.169	33.029	1.378	58.291	89.339	107.236
Anthanthrene	mg/kg	9.451	0.796	0.291	1.347	0.04	16.494	0.673	5.514	25.177	35.233
Total PAH	mg/kg	646.929	51.415	169.569	99.133	3.121	1020.64	55.015	1975.777	782.861	6032.608
Easily-liberatable Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	4.86	<1	<1
Complex Cyanide	mg/kg	6.0	<2.5	16.9	8.7	<2.5	124.3	<2.5	1149.1	402.5	79.1
Total Cyanide	mg/kg	6.0	<2.5	16.86	8.67	<2.5	124.3	<2.5	1154.0	402.5	79.1
Elemental Sulphur	mg/kg	<50	686	1095	158	<50	<50	237	55546	2701	<50
Exchangeable Ammonium	mg/kg	28.1	56.0	9.1	8.1	7.9	11.3	22.7	134.3	10.1	5.3
Arsenic	mg/kg	<1	<1	46	48	45	<1	<1	12	102	116
Cadmium	mg/kg	<1	<1	4	1	<1	<1	<1	<1	<1	3
Chromium	mg/kg	10	66	169	96	78	91	119	111	64	111
Lead	mg/kg	44	41	1519	1094	1747	273	47	333	1592	1969
Mercury	mg/kg	6	9	<1	<1	<1	3	<1	<1	<1	<1
Selenium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	mg/kg	25	21	217	109	136	150	32	126	178	387
Nickel	mg/kg	31	80	97	53	107	117	78	80	153	232
Zinc	mg/kg	55	76	1271	728	497	708	159	345	284	1504
Boron	mg/kg	2	2	<1	<1	<1	<1	<1	2	<1	<1
Benzene	mg/kg	-	0.163	0.954	<0.001	<0.001	<0.001	0.011	0.005	1.312	0.012
Toluene	mg/kg	-	0.006	1.183	<0.001	<0.001	0.006	0.027	0.002	0.004	0.169
Ethylbenzene	mg/kg	-	0.001	4.193	<0.001	<0.001	<0.001	0.003	0.004	0.002	0.383
Xylene	mg/kg	-	0.013	4.203	<0.001	<0.001	0.001	0.02	0.028	0.008	10.985
2-Isopropyl Phenol by HPLC	mg/kg	<0.01	<0.01	0.03	0.06	<0.01	<0.01	<0.01	0.21	0.14	2.46
Catechol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzene by GC	mg/kg	1.228	-	-	-	-	-	-	0.039	-	-
Ethylbenzene by GC	mg/kg	0.32	-	-	-	-	-	-	0.07	-	-
Toluene by GC	mg/kg	0.294	-	-	-	-	-	-	0.017	-	-
Xylene by GC	mg/kg	0.802	-	-	-	-	-	-	0.419	-	-
Chloride	mg/kg	300	45	80	35	270	25	60	615	310	115
Sulphate Soluble as SO4	mg/kg	3685	210	115	230	43	4930	145	7915	1530	370
MTBE by GC	mg/kg	<0.05	-	-	-	-	-	-	<0.01	-	-
Total TPH	mg/kg	-	<10	25886	36	25	558	66	3931	139	5234

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	BH 42 3.00	BH 42 5.00	BH 43 0.60	BH 43 2.05	BH 43 4.20	IP 04 0.40	TT 100 1.40	TT 100 2.20	TT 100 DUP 2.20	TT 101 0.80
pH	pH Units	7.44	7.54	7.60	9.35	7.84	7.87	7.65	12.61	12.60	7.77
% Loss on Ignition	%	13.0	5.0	13.0	8.0	2.0	37.0	5.0	15.0	13.0	6.0
% Moisture Content	%	12.7	15.5	16.2	26.7	7.6	3.7	13.2	30.0	27.2	9.1
% Stones	%	19.9	29.3	12.7	13.1	11.0	22.2	<0.1	2.4	<0.1	23.7
Cresols	mg/kg	33.48	19.7	2.3	0.07	0.02	357	4.15	3.45	7.34	0.01
Xylenols & Ethylphenols	mg/kg	51.44	30.45	<0.01	<0.01	0.01	554.26	7.78	2.64	5.59	<0.01
Naphthols	mg/kg	0.24	0.1	0.02	<0.01	<0.01	20.65	0.79	0.21	0.46	<0.01
Phenol	mg/kg	13.6	0.61	<0.01	<0.01	<0.01	81.82	0.99	1.29	3.45	<0.01
Trimethylphenol	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	138.63	4.18	0.42	0.84	<0.01
Total Phenols	mg/kg	129.24	76.12	2.31	0.07	0.04	1152.7	17.89	8	17.69	0.01
Naphthalene	mg/kg	1905.276	146.317	52.657	15.603	0.336	3782.908	151.828	11.714	8.292	12.024
Acenaphthylene	mg/kg	600.279	82.195	11.837	16.236	0.069	239.503	22.173	1.251	1.127	2.095
Acenaphthene	mg/kg	147.117	17.287	49.963	8.985	0.127	759.345	8.481	0.173	0.295	0.599
Fluorene	mg/kg	484.643	74.071	57.784	38.604	0.218	932.532	32.79	0.279	0.773	1.116
Phenanthrene	mg/kg	1255.486	210.461	152.577	220.786	0.807	2756.395	84.449	26.553	28.998	7.143
Anthracene	mg/kg	439.224	70.662	124.423	56.252	0.213	907.164	28.051	11.079	9.846	2.155
Fluoranthene	mg/kg	907.003	168.115	89.883	203.114	0.886	1784.275	46.371	39.464	32.789	14.102
Pyrene	mg/kg	562.9	111.022	81.836	152.906	0.733	1132.075	31.727	28.445	23.474	10.123
Cyclopenta(cd)pyrene	mg/kg	18.162	<0.001	<0.001	<0.001	0.075	4.473	0.383	0.089	0.314	<0.001
Benzo(a)anthracene	mg/kg	302.824	61.868	25.523	70.874	0.282	664.098	19.253	22.318	12.929	9.955
Chrysene	mg/kg	235.322	56.703	28.347	67.564	0.216	502.367	15.138	19.535	13.026	13.686
Benzo(b)fluoranthene	mg/kg	397.253	82.004	34.163	121.823	0.225	1033.66	33.915	39.756	25.501	39.293
Benzo(k)fluoranthene	mg/kg	94.703	26.324	12.365	33.653	0.074	232.749	5.42	8.474	6.333	9.151
Benzo(e)pyrene	mg/kg	136.325	32.582	21.176	54.573	0.112	327.732	10.271	14.283	9.303	13.305
Benzo(a)pyrene	mg/kg	210.267	46.971	27.304	60.722	0.136	524.128	15.516	19.293	12.638	10.596
Indeno(1/2/3-cd)pyrene	mg/kg	131.663	23.892	14.157	48.782	0.079	272.827	8.539	13.07	7.873	10.833
Di-benz(a/h)anthracene	mg/kg	45.894	8.016	3.863	12.402	0.034	103.347	3.151	4.051	2.375	3.466
Benzo(g/h/i)perylene	mg/kg	124.284	24.989	16.054	56.773	0.121	264.782	8.788	13.297	7.982	10.347
Anthanthrene	mg/kg	68.815	8.98	4.919	5.043	0.024	157.393	4.656	5.489	2.627	1.444
Total PAH	mg/kg	8067.44	1252.458	808.829	1244.695	4.768	16681.693	530.901	278.612	206.495	171.433
Easily-liberatable Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Complex Cyanide	mg/kg	31.4	11.3	61.1	99.5	13	99.8	66.5	980.3	83.4	20.9
Total Cyanide	mg/kg	31.40	11.28	61.5	99.8	13.19	66.5	980.3	83.4	123.4	20.9
Elemental Sulphur	mg/kg	<50	<50	<50	<50	52	<50	1133	<50	<50	<50
Exchangeable Ammonium	mg/kg	20.4	23.1	3.0	4.9	2.8	15.4	26.3	6.7	8.2	4.9
Arsenic	mg/kg	<1	<1	<1	<1	<1	10	<1	<1	<1	<1
Cadmium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	mg/kg	13	14	15	17	11	<1	2	3	4	13
Lead	mg/kg	126	152	2105	162	15	55	35	8	14	40
Mercury	mg/kg	<1	<1	<1	<1	<1	7	2	<1	<1	5
Selenium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	mg/kg	18	17	78	34	1	5	12	12	15	25
Nickel	mg/kg	15	15	24	21	9	4	19	19	20	28
Zinc	mg/kg	198	66	222	41	17	66	20	11	14	76
Boron	mg/kg	<1	<1	1	2	<1	1	2	<1	<1	2
Benzene	mg/kg	93.281	0.11	<0.001	<0.001	0.005	21.485	0.193	0.897	0.633	0.021
Toluene	mg/kg	111.123	0.422	0.002	<0.001	<0.001	37.209	0.126	0.786	0.616	0.004
Ethylbenzene	mg/kg	25.392	0.185	<0.001	<0.001	<0.001	19.4	0.074	0.113	0.098	0.002
Xylene	mg/kg	230.479	2.157	<0.001	<0.001	<0.001	190.52	0.655	1.163	0.999	0.005
2-Isopropyl Phenol by HPLC	mg/kg	30.48	25.26	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzene by GC	mg/kg	125.96	-	-	-	0.011	47.346	-	-	-	-
Ethylbenzene by GC	mg/kg	24.696	-	-	-	<0.01	53.503	-	-	-	-
Toluene by GC	mg/kg	160.893	-	-	-	<0.01	100.701	-	-	-	-
Xylene by GC	mg/kg	201.314	-	-	-	<0.01	417.514	-	-	-	-
Chloride	mg/kg	170	150	20	25	50	120	50	115	255	100
Sulphate Soluble as SO4	mg/kg	635	275	1330	5070	520	255	665	550	305	7795
MTBE by GC	mg/kg	1.817	-	-	-	<0.01	<0.5	-	-	-	-
Total TPH	mg/kg	-	712	9635	534	-	-	343	129	98	468

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	BH 35 3.40	BH 35 GL-1.20	BH 38 0.60	BH 39 D 4.50	BH 39D 6.50	BH 40 4.00	BH 40 5.00	BH 41 C 3.50	BH 41 C 5.50	BH 42 2.00
pH	pH Units	7.71	7.88	8.09	7.91	7.83	8.90	8.01	8.72	7.62	9.63
% Loss on Ignition	%	7.0	9.0	1.0	8.0	4.0	5.0	3.0	2.0	3.0	12.0
% Moisture Content	%	17.5	7.2	4.2	26.3	18.1	13.5	15.8	6.7	4.3	14.5
% Stones	%	9.4	28.9	30.1	<0.1	346.1	5.2	4.7	80.5	60.6	16.0
Cresols	mg/kg	<0.01	<0.01	0.01	0.43	0.24	<0.01	0.02	0.85	<0.01	47.87
Xylenols & Ethylphenols	mg/kg	<0.01	0.02	<0.01	0.88	0.12	<0.01	0.01	0.6	0.07	<0.01
Naphthols	mg/kg	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/kg	<0.01	0.04	0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.01	11.52
Trimethylphenol	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/kg	<0.01	0.06	0.02	7.76	0.49	<0.01	0.06	2.55	0.07	59.39
Naphthalene	mg/kg	7.065	6.343	0.655	6.827	0.117	0.07	0.011	0.06	0.038	2244.963
Acenaphthylene	mg/kg	1.106	5.355	0.545	4.712	2.464	0.502	0.215	2.498	0.231	598.344
Acenaphthene	mg/kg	1.61	1.306	0.051	5.039	1.012	0.227	0.317	1.171	0.082	202.021
Fluorene	mg/kg	0.912	4.429	0.2	13.079	4.025	1.193	0.793	7.094	0.637	587.923
Phenanthrene	mg/kg	4.69	46.919	0.832	41.632	11.643	5.818	2.035	22.691	2.482	1813.142
Anthracene	mg/kg	1.296	10.997	0.272	10.835	3.728	1.321	0.595	7.279	0.901	682.484
Fluoranthene	mg/kg	5.067	59.915	0.953	30.206	15.341	5.693	1.965	15.986	1.703	1110.939
Pyrene	mg/kg	4.397	44.65	0.737	16.972	8.687	3.348	1.304	8.711	1.051	705.788
Cyclopenta(cd)pyrene	mg/kg	0.812	8.465	<0.001	0.09	0.036	0.015	<0.001	0.116	<0.001	52.209
Benzo(a)anthracene	mg/kg	3.007	27.623	0.547	15.658	7.696	2.891	0.73	6.99	0.453	541.625
Chrysene	mg/kg	2.762	22.015	0.525	6.767	4.699	2.128	0.678	4.068	0.367	307.132
Benzo(b)fluoranthene	mg/kg	5.245	61.063	1.102	18.195	12.845	4.489	0.885	7.907	0.497	456.085
Benzo(k)fluoranthene	mg/kg	1.845	14.512	0.388	2.373	2.458	0.783	0.23	1.458	0.135	87.045
Benzo(e)pyrene	mg/kg	2.085	19.622	0.546	4.703	3.618	1.35	0.247	2.057	0.136	155.569
Benzo(a)pyrene	mg/kg	3.07	27.112	0.691	7.603	5.928	1.876	0.375	3.413	0.243	270.199
Indeno(1/2/3-cd)pyrene	mg/kg	1.643	24.692	0.554	4.029	3.756	1.314	0.312	2.135	0.152	118.299
Di-benz(a/h)anthracene	mg/kg	0.546	6.677	0.149	1.379	1.212	0.423	0.097	0.587	0.043	30.478
Benzo(g/h/i)perylene	mg/kg	1.854	31.26	0.692	4.892	4.115	1.687	0.356	2.341	0.166	139.275
Anthanthrene	mg/kg	0.651	12.158	0.158	1.971	1.559	0.547	0.117	0.904	0.068	90.659
Total PAH	mg/kg	49.663	435.114	9.598	196.964	94.94	35.67	11.261	97.465	9.385	10194.178
Easily-liberatable Cyanide	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.85
Complex Cyanide	mg/kg	136.4	101.2	<2.5	71.8	24.5	102.7	17.2	60.8	19.2	58.2
Total Cyanide	mg/kg	136.5	101.8	<2.5	72.0	24.53	102.9	17.21	61.2	19.18	60.0
Elemental Sulphur	mg/kg	1416	<50	<50	280	339	1180	435	403	2276	<50
Exchangeable Ammonium	mg/kg	13.1	5.8	4.0	75.6	69.3	42.5	36.6	8.9	62.6	31.7
Arsenic	mg/kg	<1	28	<1	<1	<1	<1	<1	<1	2	93
Cadmium	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	2
Chromium	mg/kg	13	29	5	51	21	19	11	13	4	105
Lead	mg/kg	186	797	23	79	17	79	20	3	<1	379
Mercury	mg/kg	<1	7	<1	1	<1	<1	<1	1	<1	2
Selenium	mg/kg	<1	<1	<1	<1	<1	<1	<1	2	<1	<1
Copper	mg/kg	32	270	15	28	17	47	13	15	6	138
Nickel	mg/kg	14	61	8	56	26	24	16	19	4	158
Zinc	mg/kg	66	386	26	72	42	50	26	26	12	1237
Boron	mg/kg	<1	<1	<1	<1	<1	<1	<1	4	3	<1
Benzene	mg/kg	0.048	<0.001	<0.001	0.016	<0.001	0.003	0.052	0.537	0.061	90.124
Toluene	mg/kg	<0.001	0.001	<0.001	0.021	0.004	0.005	0.036	0.569	0.517	108.076
Ethylbenzene	mg/kg	0.008	<0.001	<0.001	0.016	<0.001	<0.001	0.019	0.508	0.768	18.617
Xylene	mg/kg	<0.001	<0.001	<0.001	0.071	0.002	0.002	0.036	1.255	10.179	188.196
2-Isopropyl Phenol by HPLC	mg/kg	<0.01	<0.01	<0.01	6.42	0.12	<0.01	<0.01	1.1	<0.01	<0.01
Catechol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzene by GC	mg/kg	-	-	-	-	0.236	-	-	-	-	-
Ethylbenzene by GC	mg/kg	-	-	-	-	0.259	-	-	-	-	-
Toluene by GC	mg/kg	-	-	-	-	0.203	-	-	-	-	-
Xylene by GC	mg/kg	-	-	-	-	1.167	-	-	-	-	-
Chloride	mg/kg	585	220	65	95	95	610	95	280	285	140
Sulphate Soluble as SO4	mg/kg	280	455	55	1435	1420	1380	380	430	425	1100
MTBE by GC	mg/kg	-	-	-	-	<0.01	-	-	-	-	-
Total TPH	mg/kg	175	<100	141	662	620	114	<10	123	24	17003

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:01

For inspection purposes only.
Consent of copyright owner required for any other use.

Soil Chemical Results

Highlighted Copy

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	Dutch	ICRCL/Other	BH 35 3.40	BH 35 GL-1.20	BH 38 0.60	BH 39D 4.50	BH 39D 6.50	BH 40 4.00	BH 40 5.00	BH 41 C 3.50
pH	pH Units			7.71	7.88	8.09	7.91	7.83	8.9	8.01	8.72
% Loss on Ignition	%		25	7	9	1	8	4	5	3	2
% Moisture Content	%			17.5	7.2	4.2	26.3	18.1	13.5	15.8	6.7
% Stones	%			9.4	28.9	30.1	0.1	346.1	5.2	4.7	80.5
Cresols	mg/kg			0.01	0.01	0.01	0.43	0.24	0.01	0.02	0.85
Xylenols & Ethylphenols	mg/kg			0.01	0.02	0.01	0.88	0.12	0.01	0.01	0.6
Naphthols	mg/kg			0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01
Phenol	mg/kg			0.01	0.04	0.01	0.01	0.01	0.01	0.03	0.01
Trimethylphenol	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/kg	45		0.01	0.06	0.02	7.76	0.49	0.01	0.06	2.55
Naphthalene	mg/kg			7.065	6.343	0.655	6.827	0.117	0.07	0.011	0.06
Acenaphthylene	mg/kg			1.106	5.355	0.545	4.712	2.464	0.502	0.215	2.498
Acenaphthene	mg/kg			1.61	1.306	0.051	5.039	1.012	0.227	0.317	1.171
Fluorene	mg/kg			0.912	4.429	0.2	13.079	4.025	1.193	0.793	7.094
Phenanthrene	mg/kg			4.69	46.919	0.832	41.632	11.643	5.818	2.035	22.691
Anthracene	mg/kg			1.296	10.997	0.272	10.835	3.728	1.321	0.595	7.279
Fluoranthene	mg/kg			5.067	59.915	0.953	30.206	15.341	5.693	1.965	15.986
Pyrene	mg/kg			4.397	44.65	0.737	16.972	8.687	3.348	1.304	8.711
Cyclopenta(cd)pyrene	mg/kg			0.812	8.465	0.001	0.09	0.036	0.015	0.001	0.116
Benzo(a)anthracene	mg/kg			3.007	27.623	0.547	15.658	7.696	2.891	0.73	6.99
Chrysene	mg/kg			2.762	22.015	0.525	6.767	4.699	2.128	0.678	4.068
Benzo(b)fluoranthene	mg/kg			5.245	61.063	1.102	18.195	12.845	4.489	0.885	7.907
Benzo(k)fluoranthene	mg/kg			1.845	14.512	0.388	2.373	2.458	0.783	0.23	1.458
Benzo(e)pyrene	mg/kg			2.085	19.622	0.546	4.703	3.618	1.35	0.247	2.057
Benzo(a)pyrene	mg/kg			3.07	27.112	0.691	7.603	5.928	1.876	0.375	3.413
Indeno(1/2/3-cd)pyrene	mg/kg			1.643	24.692	0.554	4.029	3.756	1.314	0.312	2.135
Di-benz(a/h)anthracene	mg/kg			0.546	6.677	0.149	1.379	1.212	0.423	0.097	0.587
Benzo(g/h/i)perylene	mg/kg			1.854	31.26	0.692	4.892	4.115	1.687	0.356	2.341
Anthanthrene	mg/kg			0.651	12.158	0.168	1.971	1.559	0.547	0.117	0.904
Total PAH	mg/kg			49.663	435.114	8.598	196.964	94.94	35.674	11.261	97.465
TOTAL 10 Dutch PAH	*mg/kg*	40		32.299	271.388	6.109	130.822	59.481	23.581	7.287	66.421
Easily-liberatable Cyanide	mg/kg			1	1	1	1	1	1	1	1
Complex Cyanide	mg/kg			136.4	101.2	2.5	71.8	24.7	102.7	17.2	60.8
Total Cyanide	mg/kg	70		136.5	101.8	2.5	72	24.73	102.9	17.21	61.2
Elemental Sulphur	mg/kg		5000	1416	50	50	280	639	1180	435	403
Exchangeable Ammonium	mg/kg			13.1	5.8	4	75.8	69.3	42.5	36.6	8.9
Arsenic	mg/kg	55		1	28	1	1	1	1	1	1
Cadmium	mg/kg	12		1	1	1	1	1	1	1	1
Chromium	mg/kg	380		13	29	5	51	21	19	11	13
Lead	mg/kg	530		186	797	23	79	17	79	20	3
Mercury	mg/kg	10		1	7	1	1	1	1	1	1
Selenium	mg/kg		6	1	1	1	1	1	1	1	2
Copper	mg/kg	190		32	270	15	28	17	47	13	15
Nickel	mg/kg	210		14	61	8	56	26	24	16	19
Zinc	mg/kg	720		66	386	26	72	42	50	26	26
Boron	mg/kg		3	1	1	1	1	1	1	1	4
Benzene	mg/kg	1		0.048	0.001	0.001	0.016	0.001	0.003	0.052	0.537
Toluene	mg/kg	130		0.001	0.001	0.001	0.021	0.004	0.005	0.036	0.569
Ethylbenzene	mg/kg	50		0.008	0.001	0.001	0.016	0.001	0.001	0.019	0.508
Xylene	mg/kg	25		0.001	0.001	0.001	0.071	0.002	0.002	0.036	1.255
2-Isopropyl Phenol by HPLC	mg/kg			0.01	0.01	0.01	6.42	0.12	0.01	0.01	1.1
Catechol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	1						0.236			
Ethylbenzene by GC	mg/kg	130						0.259			
Toluene by GC	mg/kg	50						0.203			
Xylene by GC	mg/kg	25						1.167			
Chloride	mg/kg			585	220	65	95	95	610	95	280
Sulphate Soluble as SO4	mg/kg	2000		280	455	55	1435	1420	1380	380	430
MTBE by GC	mg/kg							0.01			
Total TPH	mg/kg		800	175	100	141	662	620	114	10	123

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	Dutch	ICRCL/Other	BH 41 C 5.50	BH 42 2.00	BH 42 3.00	BH 42 5.00	BH 43 0.60	BH 43 2.05	BH 43 4.20	IP 04 0.40
pH	pH Units			7.62	9.63	7.44	7.54	7.6	9.35	7.84	7.87
% Loss on Ignition	%		25	3	12	13	5	13	8	2	37
% Moisture Content	%			4.3	14.5	12.7	15.5	16.2	26.7	7.6	3.7
% Stones	%			60.6	16	19.9	29.3	12.7	13.1	11	22.2
Cresols	mg/kg			0.01	47.87	33.48	19.7	2.3	0.07	0.02	357
Xylenols & Ethylphenols	mg/kg			0.07	0.01	51.44	30.45	0.01	0.01	0.01	554.26
Naphthols	mg/kg			0.01	0.01	0.24	0.1	0.02	0.01	0.01	20.65
Phenol	mg/kg			0.01	11.52	13.6	0.61	0.01	0.01	0.01	81.82
Trimethylphenol	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	138.63
Total Phenols	mg/kg	45		0.07	59.39	129.24	76.12	2.31	0.07	0.04	1152.7
Naphthalene	mg/kg			0.038	2244.963	1905.276	146.317	52.657	15.603	0.336	3782.908
Acenaphthylene	mg/kg			0.231	598.344	600.279	82.195	11.837	16.236	0.069	239.503
Acenaphthene	mg/kg			0.082	202.021	147.117	17.287	49.963	8.985	0.127	759.345
Fluorene	mg/kg			0.637	587.923	484.643	74.071	57.784	38.604	0.218	932.532
Phenanthrene	mg/kg			2.482	1813.142	1255.486	210.461	152.577	220.786	0.807	2756.395
Anthracene	mg/kg			0.901	682.484	439.224	70.662	124.423	56.252	0.213	907.164
Fluoranthene	mg/kg			1.703	1110.939	907.003	168.115	89.883	203.114	0.886	1784.275
Pyrene	mg/kg			1.051	705.788	562.9	111.022	81.836	152.906	0.733	1132.075
Cyclopenta(cd)pyrene	mg/kg			0.001	52.209	18.162	0.001	0.001	0.001	0.075	4.473
Benzo(a)anthracene	mg/kg			0.453	541.625	302.824	61.868	25.523	70.874	0.282	664.098
Chrysene	mg/kg			0.367	307.132	235.322	56.703	28.347	67.564	0.216	502.367
Benzo(b)fluoranthene	mg/kg			0.497	456.085	397.253	82.004	34.163	121.823	0.225	1033.66
Benzo(k)fluoranthene	mg/kg			0.135	87.045	94.703	26.324	12.365	33.653	0.074	232.749
Benzo(e)pyrene	mg/kg			0.136	155.569	136.325	32.582	21.176	54.573	0.112	327.732
Benzo(a)pyrene	mg/kg			0.243	270.199	210.267	46.971	27.304	60.722	0.136	524.128
Indeno(1/2/3-cd)pyrene	mg/kg			0.152	118.299	131.663	23.892	14.157	48.782	0.079	272.827
Di-benz(a/h)anthracene	mg/kg			0.043	30.478	45.894	8.016	3.863	12.402	0.034	103.347
Benzo(g/h/i)perylene	mg/kg			0.166	139.275	124.284	24.989	16.054	56.773	0.121	264.782
Anthanthrene	mg/kg			0.068	90.659	68.815	8.98	4.919	5.043	0.024	157.333
Total PAH	mg/kg			9.385	10194.18	8067.44	1252.458	808.829	1244.695	4.768	16381.69
TOTAL 10 Dutch PAH	*mg/kg*	40		6.64	7315.103	5606.052	836.302	543.29	834.123	3.15	11691.69
Easily-liberatable Cyanide	mg/kg			1	1.85	1	1	1	1	1	1
Complex Cyanide	mg/kg			19.2	58.2	31.4	11.3	61.1	99.5	13.9	99.8
Total Cyanide	mg/kg	70		19.18	60	31.4	11.28	61.5	99.8	13.19	66.5
Elemental Sulphur	mg/kg		5000	2276	50	50	50	50	50	52	50
Exchangeable Ammonium	mg/kg			82.6	31.7	20.4	23.1	3	4.9	2.8	15.4
Arsenic	mg/kg	55		2	93	1	1	1	1	1	10
Cadmium	mg/kg	12		1	2	1	1	1	1	1	1
Chromium	mg/kg	380		4	105	13	14	15	17	11	1
Lead	mg/kg	530		1	379	126	152	2105	162	15	55
Mercury	mg/kg	10		1	2	1	1	1	1	1	7
Selenium	mg/kg		6	1	1	1	1	1	1	1	1
Copper	mg/kg	190		6	138	18	17	78	34	1	5
Nickel	mg/kg	210		4	158	15	15	24	21	9	4
Zinc	mg/kg	720		12	1237	198	66	222	41	17	66
Boron	mg/kg		3	3	1	1	1	1	2	1	1
Benzene	mg/kg	1		0.061	90.124	93.281	0.11	0.001	0.001	0.005	21.485
Toluene	mg/kg	130		0.517	108.076	111.123	0.422	0.002	0.001	0.001	37.209
Ethylbenzene	mg/kg	50		0.768	18.617	25.392	0.185	0.001	0.001	0.001	19.4
Xylene	mg/kg	25		10.179	188.196	230.479	2.157	0.001	0.001	0.001	190.52
2-Isopropyl Phenol by HPLC	mg/kg			0.01	0.01	30.48	25.26	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	1				125.96				0.011	47.346
Ethylbenzene by GC	mg/kg	130				24.696				0.01	53.503
Toluene by GC	mg/kg	50				160.893				0.01	100.701
Xylene by GC	mg/kg	25				201.314				0.01	417.514
Chloride	mg/kg			285	140	170	150	20	25	50	120
Sulphate Soluble as SO4	mg/kg	2000		425	1100	635	275	1330	5070	520	255
MTBE by GC	mg/kg					1.817				0.01	0.5
Total TPH	mg/kg		800	24	17003		712	9635	534		

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:01

client sample ID Depth	Units	Dutch	ICRCL/Other	TT 100 1.40	TT 100 2.20	TT 100 DUP 2.20	TT 101 0.80	TT 101 2.70	TT 101 3.80	TT 102 2.00	TT 104 1.20
pH	pH Units			7.65	12.61	12.6	7.77	7.52	8.2	8.13	7.73
% Loss on Ignition	%		25	5	15	13	6	12	3	4	7
% Moisture Content	%			13.2	30	27.2	9.1	14.6	12.7	14.7	13.7
% Stones	%			0.1	2.4	0.1	23.7	47.7	0.1	5	19
Cresols	mg/kg			4.15	3.45	7.34	0.01	0.02	0.14	0.02	0.46
Xylenols & Ethylphenols	mg/kg			7.78	2.64	5.59	0.01	0.22	0.24	0.03	0.01
Naphthols	mg/kg			0.79	0.21	0.46	0.01	0.02	0.01	0.01	0.01
Phenol	mg/kg			0.99	1.29	3.45	0.01	0.01	0.04	0.01	0.75
Trimethylphenol	mg/kg			4.18	0.42	0.84	0.01	0.2	0.05	0.01	0.01
Total Phenols	mg/kg	45		17.89	8	17.69	0.01	0.47	0.47	0.1	1.28
Naphthalene	mg/kg			151.828	11.714	8.292	12.024	74.271	12.304	26.188	0.509
Acenaphthylene	mg/kg			22.173	1.251	1.127	2.095	4.298	0.484	19.043	2.686
Acenaphthene	mg/kg			8.481	0.173	0.295	0.599	9.285	1.8	5.657	0.161
Fluorene	mg/kg			32.79	0.279	0.773	1.116	11.543	2.249	21.301	0.818
Phenanthrene	mg/kg			84.449	26.553	28.998	7.143	60.144	7.42	57.025	6.126
Anthracene	mg/kg			28.051	11.079	9.846	2.155	10.637	2.078	9.357	8.438
Fluoranthene	mg/kg			46.371	39.464	32.789	14.102	70.145	5.507	8.656	11.921
Pyrene	mg/kg			31.727	28.445	23.474	10.123	49.932	3.976	12.328	13.991
Cyclopenta(cd)pyrene	mg/kg			0.383	0.089	0.314	0.001	7.91	0.001	0.626	2.893
Benzo(a)anthracene	mg/kg			19.253	22.318	12.929	9.955	37.412	1.808	1.353	6.635
Chrysene	mg/kg			15.138	19.535	13.026	13.686	41.789	1.662	2.063	6.669
Benzo(b)fluoranthene	mg/kg			33.915	39.756	25.501	39.293	101.982	3.194	1.597	8.024
Benzo(k)fluoranthene	mg/kg			5.42	8.474	6.333	9.151	17.059	0.999	0.349	3.354
Benzo(e)pyrene	mg/kg			10.271	14.283	9.303	13.305	36.584	1.384	0.95	5.498
Benzo(a)pyrene	mg/kg			15.516	19.293	12.638	10.596	39.318	2.25	0.889	6.241
Indeno(1/2/3-cd)pyrene	mg/kg			8.539	13.07	7.873	10.833	27.249	1.437	0.623	5.437
Di-benz(a/h)anthracene	mg/kg			3.151	4.051	2.375	3.466	10.285	0.436	0.179	1.511
Benzo(g/h/i)perylene	mg/kg			8.788	13.297	7.982	10.347	27.636	1.631	1.093	6.874
Anthanthrene	mg/kg			4.656	5.489	2.627	1.444	9.451	0.796	0.291	1.347
Total PAH	mg/kg			530.901	278.612	206.495	171.433	646.929	51.415	169.569	99.133
TOTAL 10 Dutch PAH	*mg/kg*	40		383.353	184.782	140.706	99.992	405.66	37.096	107.596	62.204
Easily-liberatable Cyanide	mg/kg			1	1	1	1	1	1	1	1
Complex Cyanide	mg/kg			66.5	980.3	83.4	20.9	6	2.5	16.9	8.7
Total Cyanide	mg/kg	70		980.3	83.4	123.4	20.9	6	2.5	16.86	8.67
Elemental Sulphur	mg/kg		5000	1138	50	50	50	50	686	1095	158
Exchangeable Ammonium	mg/kg			26.3	6.7	8.2	4.9	28.1	56	9.1	8.3
Arsenic	mg/kg	55		1	1	1	1	1	1	46	48
Cadmium	mg/kg	12		1	1	1	1	1	1	4	1
Chromium	mg/kg	380		2	3	4	13	10	66	169	96
Lead	mg/kg	530		35	8	14	40	44	41	1513	1094
Mercury	mg/kg	10		2	1	1	5	6	9	1	1
Selenium	mg/kg		6	1	1	1	1	1	1	1	1
Copper	mg/kg	190		12	12	15	25	25	21	217	109
Nickel	mg/kg	210		19	19	20	28	31	80	97	53
Zinc	mg/kg	720		20	11	14	76	55	76	1271	728
Boron	mg/kg		3	2	1	1	2	2	2	1	1
Benzene	mg/kg	1		0.193	0.897	0.633	0.021		0.163	0.954	0.001
Toluene	mg/kg	130		0.126	0.786	0.616	0.004		0.006	1.183	0.001
Ethylbenzene	mg/kg	50		0.074	0.113	0.098	0.002		0.001	4.193	0.001
Xylene	mg/kg	25		0.655	1.163	0.999	0.005		0.013	4.203	0.001
2-Isopropyl Phenol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.06
Catechol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	1						1.228			
Ethylbenzene by GC	mg/kg	130						0.32			
Toluene by GC	mg/kg	50						0.294			
Xylene by GC	mg/kg	25						0.802			
Chloride	mg/kg			50	115	255	100	300	45	80	35
Sulphate Soluble as SO4	mg/kg	2000		665	550	305	7795	3685	210	115	230
MTBE by GC	mg/kg							0.05			
Total TPH	mg/kg		800	343	129	98	468		10	25886	36

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

client sample ID Depth	Units	Dutch	ICRCL/Other	TT 52 EARTH	TT 53 1.00	TT 53 4.50	TT 54 0.50	TT 54 4.20	TT 54 E 0.60	TT 55 0.60	TT 55 2.00
pH	pH Units			7.48	7.54	7.86	7.18	6	8.46	7.24	7.78
% Loss on Ignition	%		25	1	9	4	39	17	16	12	11
% Moisture Content	%			8.4	21.9	37.9	19.4	27.5	13.1	17.5	34.2
% Stones	%			28.8	20.4	0.1	27.9	34.8	25.1	51.5	11.3
Cresols	mg/kg			0.01	2.27	0.01	0.64	0.82	1.74	0.01	32.59
Xylenols & Ethylphenols	mg/kg			0.01	2.29	0.01	1.5	1.14	4.65	0.01	0.01
Naphthols	mg/kg			0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.01
Phenol	mg/kg			0.01	0.64	0.01	0.13	0.68	0.88	0.01	5.16
Trimethylphenol	mg/kg			0.01	0.01	0.01	0.01	0.1	0.35	0.01	0.01
Total Phenols	mg/kg	45		0.01	5.19	0.01	2.48	2.89	10.1	0.01	37.75
Naphthalene	mg/kg			0.51	25.35	4.689	127.279	8.39	1249.912	29.182	3651.266
Acenaphthylene	mg/kg			0.187	13.43	0.658	23.42	1.374	375.939	10.521	239.141
Acenaphthene	mg/kg			0.043	2.883	0.565	15.9	4.109	155.361	15.201	759.413
Fluorene	mg/kg			0.122	16.577	1.527	54.842	3.681	435.693	21.831	922.376
Phenanthrene	mg/kg			0.351	167.512	7.965	352.204	31.808	1036.478	76.964	2519.719
Anthracene	mg/kg			0.128	55.068	2.691	89.242	9.25	334.663	29.733	1113.534
Fluoranthene	mg/kg			0.363	157.269	7.799	312.509	81.974	678.309	94.365	1252.986
Pyrene	mg/kg			0.312	114.899	5.662	352.486	72.696	402.853	57.94	829.242
Cyclopenta(cd)pyrene	mg/kg			0.058	3.867	0.322	28.508	14.704	81.054	0.747	41.021
Benzo(a)anthracene	mg/kg			0.149	97.01	4.703	114.266	58.769	248.18	48.208	447.044
Chrysene	mg/kg			0.146	62.216	3.1	115.988	57.59	193.98	31.741	441.532
Benzo(b)fluoranthene	mg/kg			0.132	99.397	6.114	110.149	83.64	232.88	70.757	612.423
Benzo(k)fluoranthene	mg/kg			0.069	21.059	1.133	36.557	32.341	70.656	14.595	104.902
Benzo(e)pyrene	mg/kg			0.087	39.493	1.893	56.969	49.829	109.388	20.534	187.257
Benzo(a)pyrene	mg/kg			0.081	58.691	2.761	61.951	63.876	145.136	31.077	306.311
Indeno(1/2/3-cd)pyrene	mg/kg			0.135	29.212	1.053	47.356	74.337	106.022	16.025	140.816
Di-benz(a/h)anthracene	mg/kg			0.04	7.055	0.329	12.346	19.977	33.637	4.294	38.268
Benzo(g/h/i)perylene	mg/kg			0.169	33.029	1.378	58.291	89.339	107.236	17.036	152.554
Anthanthrene	mg/kg			0.04	16.494	0.673	5.514	25.177	35.233	7.635	87.515
Total PAH	mg/kg			3.121	1020.51	55.045	1975.777	782.861	6032.608	598.387	13847.32
TOTAL 10 Dutch PAH	*mg/kg*	40		2.101	706.416	37.272	1315.643	507.674	4170.572	388.926	10130.66
Easily-liberatable Cyanide	mg/kg			1	1	1	4.86	1	1	2.47	1.2
Complex Cyanide	mg/kg			2.5	224.3	2.5	1149.1	402.5	79.1	280.8	2042.2
Total Cyanide	mg/kg	70		2.5	124.3	2.5	1154	402.5	79.1	283.3	2043.4
Elemental Sulphur	mg/kg		5000	50	50	237	55546	2701	50	3036	50
Exchangeable Ammonium	mg/kg			7.9	11.3	22.7	134.3	10.1	5.3	10.3	48.1
Arsenic	mg/kg	55		45	1	1	12	102	116	8	1
Cadmium	mg/kg	12		1	1	1	1	1	3	4	4
Chromium	mg/kg	380		78	91	119	111	64	111	79	92
Lead	mg/kg	530		1747	273	47	333	1592	1969	1632	434
Mercury	mg/kg	10		1	3	1	1	1	1	1	1
Selenium	mg/kg		6	1	1	1	1	1	1	1	1
Copper	mg/kg	190		136	150	32	126	178	387	644	28
Nickel	mg/kg	210		107	117	78	80	153	232	111	40
Zinc	mg/kg	720		497	708	159	345	284	1504	1637	840
Boron	mg/kg		3	1	1	1	2	1	1	1	1
Benzene	mg/kg	1		0.001	0.001	0.011	0.005	1.312	0.012	0.008	111.645
Toluene	mg/kg	130		0.001	0.006	0.027	0.002	0.004	0.169	0.019	401.893
Ethylbenzene	mg/kg	50		0.001	0.001	0.003	0.004	0.002	0.383	0.03	89.473
Xylene	mg/kg	25		0.001	0.001	0.02	0.028	0.008	10.985	0.256	710.823
2-Isopropyl Phenol by HPLC	mg/kg			0.01	0.01	0.01	0.21	0.14	2.46	0.01	0.01
Catechol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	1					0 039				38.959
Ethylbenzene by GC	mg/kg	130					0.07				28.685
Toluene by GC	mg/kg	50					0.017				149.254
Xylene by GC	mg/kg	25					0.419				182.698
Chloride	mg/kg			270	25	60	615	310	115	170	130
Sulphate Soluble as SO4	mg/kg	2000		43	4930	145	7915	1530	370	5100	850
MTBE by GC	mg/kg						0.01				0.445
Total TPH	mg/kg		800	25	558	66	3931	139	5234	5128	26907

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

client sample ID Depth	Units	Dutch	ICRCL/Other	TT 56 0.30	TT 56 1.75	TT 57 1.00	TT 57 4.00	TT 58 1.00	TT 58 2.00	TT 59 1.30
pH	pH Units			6.3	8.23	7.39	6.9	8.28	8.79	7.05
% Loss on Ignition	%		25	5	6	8	2	10	9	12
% Moisture Content	%			9.2	12.5	13.5	12.2	26.2	23.8	8.6
% Stones	%			34.9	41.9	26.7	8.2	13.2	16.3	35.4
Cresols	mg/kg			0.01	0.01	0.01	0.12	0.06	0.01	0.22
Xylenols & Ethylphenols	mg/kg			0.01	0.02	0.01	0.04	0.01	0.01	0.02
Naphthols	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/kg			0.01	0.01	0.01	0.04	0.03	0.01	0.09
Trimethylphenol	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/kg	45		0.01	0.04	0.02	0.21	0.08	0.01	0.5
Naphthalene	mg/kg			0.26	2.357	1.632	0.033	49.974	1.249	32.978
Acenaphthylene	mg/kg			0.523	4.868	1.362	0.029	4.807	0.696	27.831
Acenaphthene	mg/kg			0.073	0.958	0.261	0.008	0.644	0.705	5.868
Fluorene	mg/kg			0.301	2.204	0.674	0.011	2.742	0.668	20.671
Phenanthrene	mg/kg			0.951	7.852	5.723	0.097	6.892	2.705	63.236
Anthracene	mg/kg			0.406	3.639	2.308	0.072	2.463	1.018	22.819
Fluoranthene	mg/kg			1.436	13.65	13.244	0.105	4.466	6.705	71.778
Pyrene	mg/kg			1.248	12.232	10.412	0.095	3.346	5.42	50.715
Cyclopenta(cd)pyrene	mg/kg			0.426	2.105	2.196	0.029	0.539	1.041	8.335
Benzo(a)anthracene	mg/kg			1.411	6.496	7.367	0.098	1.806	3.865	28.475
Chrysene	mg/kg			1.435	6.679	6.473	0.098	2.182	3.986	25.469
Benzo(b)fluoranthene	mg/kg			2	11.211	11.8	0.113	2.916	9.506	45.248
Benzo(k)fluoranthene	mg/kg			1.065	4.521	3.589	0.057	0.961	2.308	14.107
Benzo(e)pyrene	mg/kg			1.216	6.321	5.298	0.075	1.665	4.44	18.243
Benzo(a)pyrene	mg/kg			1.319	4.421	6.087	0.076	1.285	4.604	21.08
Indeno(1/2/3-cd)pyrene	mg/kg			1.534	7.452	6.237	0.098	2.64	5.952	21.72
Di-benz(a/h)anthracene	mg/kg			0.381	2.051	1.696	0.001	0.73	1.308	5.185
Benzo(g/h/i)perylene	mg/kg			1.855	8.616	6.643	0.096	2.889	6.419	23.635
Anthanthrene	mg/kg			0.255	0.754	2.328	0.001	0.673	1.102	4.977
Total PAH	mg/kg			18.095	108.39	85.329	1.191	93.619	63.696	512.372
TOTAL 10 Dutch PAH	*mg/kg*	40		11.672	65.683	59.303	0.83	75.558	38.811	325.297
Easily-liberatable Cyanide	mg/kg			1	1	1	1	1.02	2.39	1.78
Complex Cyanide	mg/kg			4.1	10.8	2.5	19	106.5	114.3	115.8
Total Cyanide	mg/kg	70		4.1	10.75	2.5	19.02	107.5	116.7	117.6
Elemental Sulphur	mg/kg		5000	50	211	50	50	50	196	72
Exchangeable Ammonium	mg/kg			2.3	6.8	3.2	13.3	10	4.3	33.2
Arsenic	mg/kg	55		3	54	41	49	16	38	85
Cadmium	mg/kg	12		1	5	3	4	1	2	1
Chromium	mg/kg	380		146	48	117	136	100	56	115
Lead	mg/kg	530		127	674	905	1101	496	1522	130
Mercury	mg/kg	10		1	1	1	1	1	1	1
Selenium	mg/kg		6	1	1	1	1	1	1	1
Copper	mg/kg	190		178	152	159	217	102	128	70
Nickel	mg/kg	210		254	242	77	90	55	83	213
Zinc	mg/kg	720		424	1116	1017	1275	423	1008	350
Boron	mg/kg		3	1	1	1	1	1	2	1
Benzene	mg/kg	1		0.001	0.022	0.001	0.001	0.001	0.001	0.001
Toluene	mg/kg	130		0.001	0.03	0.001	0.001	0.001	0.001	0.002
Ethylbenzene	mg/kg	50		0.001	0.017	0.001	0.001	0.001	0.001	0.001
Xylene	mg/kg	25		0.001	0.084	0.001	0.001	0.001	0.001	0.006
2-Isopropyl Phenol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg			0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	1					0.01			
Ethylbenzene by GC	mg/kg	130					0.01			
Toluene by GC	mg/kg	50					0.01			
Xylene by GC	mg/kg	25					0.01			
Chloride	mg/kg			20	50	40	85	30	545	475
Sulphate Soluble as SO4	mg/kg	2000		5395	7440	935	28	1190	1740	6595
MTBE by GC	mg/kg						0.01			
Total TPH	mg/kg		800	473	855	670	339	58	41	1261

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

For inspection purposes only.
Consent of copyright owner required for any other use.

Soil Chemical Results

QRA Highlighted Copy

EPA Export 29-05-2012:04:39:02

client sample ID Depth	Units	QRA	BH 35 3.40	BH 35 GL-1.20	BH 38 0.60	BH 39D 4.50	BH 39D 6.50	BH 40 4.00	BH 40 5.00	BH 41 C 3.50	BH 41 C 5.50	BH 42 2.00
pH	pH Units		7.71	7.88	8.09	7.91	7.83	8.9	8.01	8.72	7.62	9.63
% Loss on Ignition	%		7	9	1	8	4	5	3	2	3	12
% Moisture Content	%		17.5	7.2	4.2	26.3	18.1	13.5	15.8	6.7	4.3	14.5
% Stones	%		9.4	28.9	30.1	0.1	346.1	5.2	4.7	80.5	60.6	16
Cresols	mg/kg		0.01	0.01	0.01	0.43	0.24	0.01	0.02	0.85	0.01	47.87
Xylenols & Ethylphenols	mg/kg		0.01	0.02	0.01	0.88	0.12	0.01	0.01	0.6	0.07	0.01
Naphthols	mg/kg		0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/kg		0.01	0.04	0.01	0.01	0.01	0.01	0.03	0.01	0.01	11.52
Trimethylphenol	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/kg		0.01	0.06	0.02	7.76	0.49	0.01	0.06	2.55	0.07	59.39
Naphthalene	mg/kg		7.065	6.343	0.655	6.827	0.117	0.07	0.011	0.06	0.038	2244.963
Acenaphthylene	mg/kg		1.106	5.355	0.545	4.712	2.464	0.502	0.215	2.498	0.231	598.344
Acenaphthene	mg/kg		1.61	1.306	0.051	5.039	1.012	0.227	0.317	1.171	0.082	202.021
Fluorene	mg/kg		0.912	4.429	0.2	13.079	4.025	1.193	0.793	7.094	0.637	587.923
Phenanthrene	mg/kg		4.69	46.919	0.832	41.632	11.643	5.818	2.035	22.691	2.482	1813.142
Anthracene	mg/kg		1.296	10.997	0.272	10.835	3.728	1.321	0.595	7.279	0.901	682.484
Fluoranthene	mg/kg		5.067	59.915	0.953	30.206	15.341	5.693	1.965	15.986	1.703	1110.939
Pyrene	mg/kg		4.397	44.65	0.737	16.972	8.687	3.348	1.304	8.711	1.051	705.788
Cyclopenta(cd)pyrene	mg/kg		0.812	8.465	0.001	0.09	0.036	0.015	0.001	0.116	0.001	52.209
Benzo(a)anthracene	mg/kg		3.007	27.623	0.547	15.658	7.696	2.891	0.73	6.99	0.453	541.625
Chrysene	mg/kg		2.762	22.015	0.525	6.767	4.699	2.128	0.678	4.068	0.367	307.132
Benzo(b)fluoranthene	mg/kg		5.245	61.063	1.102	18.195	12.845	4.489	0.885	7.907	0.497	456.085
Benzo(k)fluoranthene	mg/kg		1.845	14.512	0.388	2.373	2.458	0.783	0.23	1.458	0.135	87.045
Benzo(e)pyrene	mg/kg		2.085	19.622	0.546	4.703	3.618	1.35	0.247	2.057	0.136	155.569
Benzo(a)pyrene	mg/kg		3.07	27.112	0.691	7.603	5.928	1.876	0.375	3.413	0.243	270.199
Indeno(1/2/3-cd)pyrene	mg/kg		1.643	24.692	0.554	4.029	3.756	1.314	0.312	2.135	0.152	118.299
Di-benz(a/h)anthracene	mg/kg		0.546	6.677	0.149	1.379	1.212	0.423	0.097	0.587	0.043	30.478
Benzo(g/h/i)perylene	mg/kg		1.854	31.26	0.692	4.892	4.115	1.687	0.356	2.341	0.166	139.275
Anthanthrene	mg/kg		0.651	12.158	0.158	1.971	1.559	0.547	0.117	0.904	0.068	90.659
Total PAH	mg/kg		49.663	435.114	9.598	196.964	94.94	35.674	11.261	97.465	9.385	10194.18
TOTAL 10 Dutch PAH	*mg/kg*		32.299	271.388	6.109	130.822	59.481	23.581	7.287	66.421	6.64	7315.103
Easily-liberatable Cyanide	mg/kg		1	1	1	1	1	1	1	1	1	1.85
Complex Cyanide	mg/kg		136.4	101.8	2.5	71.8	24.7	102.7	17.2	60.8	19.2	58.2
Total Cyanide	mg/kg		136.5	101.8	2.5	72	24.73	102.9	17.21	61.2	19.18	60
Elemental Sulphur	mg/kg		1416	50	50	280	639	1180	435	403	2276	50
Exchangeable Ammonium	mg/kg	139	13.1	5.8	4	75.8	69.3	42.5	36.6	8.9	62.6	31.7
Arsenic	mg/kg	20	1	28	1	1	1	1	1	1	2	93
Cadmium	mg/kg		1	1	1	1	1	1	1	1	1	2
Chromium	mg/kg	130	13	29	5	51	21	19	11	13	4	105
Lead	mg/kg		186	797	23	79	17	79	20	3	1	379
Mercury	mg/kg	15	1	7	1	1	1	1	1	1	1	2
Selenium	mg/kg	260	1	1	1	1	1	1	1	2	1	1
Copper	mg/kg	17	32	270	15	28	17	47	13	15	6	138
Nickel	mg/kg	75	14	61	8	56	26	24	16	19	4	158
Zinc	mg/kg	720	66	386	26	72	42	50	26	26	12	1237
Boron	mg/kg		1	1	1	1	1	1	1	4	3	1
Benzene	mg/kg	0.00224	0.048	0.001	0.001	0.016	0.001	0.003	0.052	0.537	0.061	90.124
Toluene	mg/kg		0.001	0.001	0.001	0.021	0.004	0.005	0.036	0.569	0.517	108.076
Ethylbenzene	mg/kg	156000	0.008	0.001	0.001	0.016	0.001	0.001	0.019	0.508	0.768	18.617
Xylene	mg/kg	125	0.001	0.001	0.001	0.071	0.002	0.002	0.036	1.255	10.179	188.196
2-Isopropyl Phenol by HPLC	mg/kg		0.01	0.01	0.01	6.42	0.12	0.01	0.01	1.1	0.01	0.01
Catechol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	0.00224					0.236					
Ethylbenzene by GC	mg/kg						0.259					
Toluene by GC	mg/kg	156000					0.203					
Xylene by GC	mg/kg	125					1.167					
Chloride	mg/kg	68.4	585	220	65	95	95	610	95	280	285	140
Sulphate Soluble as SO4	mg/kg	67.8	280	455	55	1435	1420	1380	380	430	425	1100
MTBE by GC	mg/kg						0.01					
Total TPH	mg/kg		175	100	141	662	620	114	10	123	24	17003

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

client sample ID Depth	Units	QRA	BH 42 3.00	BH 42 5.00	BH 43 0.60	BH 43 2.05	BH 43 4.20	IP 04 0.40	TT 100 1.40	TT 100 2.20	TT 100 DUP 2.20	TT 101 0.80
pH	pH Units		7.44	7.54	7.6	9.35	7.84	7.87	7.65	12.61	12.6	7.77
% Loss on Ignition	%		13	5	13	8	2	37	5	15	13	6
% Moisture Content	%		12.7	15.5	16.2	26.7	7.6	3.7	13.2	30	27.2	9.1
% Stones	%		19.9	29.3	12.7	13.1	11	22.2	0.1	2.4	0.1	23.7
Cresols	mg/kg		33.48	19.7	2.3	0.07	0.02	357	4.15	3.45	7.34	0.01
Xylenols & Ethylphenols	mg/kg		51.44	30.45	0.01	0.01	0.01	554.26	7.78	2.64	5.59	0.01
Naphthols	mg/kg		0.24	0.1	0.02	0.01	0.01	20.65	0.79	0.21	0.46	0.01
Phenol	mg/kg		13.6	0.61	0.01	0.01	0.01	81.82	0.99	1.29	3.45	0.01
Trimethylphenol	mg/kg		0.01	0.01	0.01	0.01	0.01	138.63	4.18	0.42	0.84	0.01
Total Phenols	mg/kg		129.24	76.12	2.31	0.07	0.04	1152.7	17.89	8	17.69	0.01
Naphthalene	mg/kg		1905.276	146.317	52.657	15.603	0.336	3782.908	151.828	11.714	8.292	12.024
Acenaphthylene	mg/kg		600.279	82.195	11.837	16.236	0.069	239.503	22.173	1.251	1.127	2.095
Acenaphthene	mg/kg		147.117	17.287	49.963	8.985	0.127	759.345	8.481	0.173	0.295	0.599
Fluorene	mg/kg		484.643	74.071	57.784	38.604	0.218	932.532	32.79	0.279	0.773	1.116
Phenanthrene	mg/kg		1255.486	210.461	152.577	220.786	0.807	2756.395	84.449	26.553	28.998	7.143
Anthracene	mg/kg		439.224	70.662	124.423	56.252	0.213	907.164	28.051	11.079	9.846	2.155
Fluoranthene	mg/kg		907.003	168.115	89.883	203.114	0.886	1784.275	46.371	39.464	32.789	14.102
Pyrene	mg/kg		562.9	111.022	81.836	152.906	0.733	1132.075	31.727	28.445	23.474	10.123
Cyclopenta(cd)pyrene	mg/kg		18.162	0.001	0.001	0.001	0.075	4.473	0.383	0.089	0.314	0.001
Benzo(a)anthracene	mg/kg		302.824	61.868	25.523	70.874	0.282	664.098	19.253	22.318	12.929	9.955
Chrysene	mg/kg		235.322	56.703	28.347	67.564	0.216	502.367	15.138	19.535	13.026	13.686
Benzo(b)fluoranthene	mg/kg		397.253	82.004	34.163	121.823	0.225	1033.66	33.915	39.756	25.501	39.293
Benzo(k)fluoranthene	mg/kg		94.703	26.324	12.365	33.653	0.074	232.749	5.42	8.474	6.333	9.151
Benzo(e)pyrene	mg/kg		136.325	32.582	21.176	54.573	0.112	327.732	10.271	14.283	9.303	13.305
Benzo(a)pyrene	mg/kg		210.267	46.971	27.304	60.722	0.136	524.128	15.516	19.293	12.638	10.596
Indeno(1/2/3-cd)pyrene	mg/kg		131.663	23.892	14.157	48.782	0.079	272.827	8.539	13.07	7.873	10.833
Di-benz(a/h)anthracene	mg/kg		45.894	8.016	3.863	12.402	0.034	103.347	3.151	4.051	2.375	3.466
Benzo(g/h/l)perylene	mg/kg		124.284	24.989	16.054	56.773	0.121	264.782	8.788	13.297	7.982	10.347
Anthanthrene	mg/kg		68.815	8.98	4.919	5.043	0.024	157.333	4.656	5.489	2.627	1.444
Total PAH	mg/kg		8067.44	1252.458	808.829	1244.695	4.768	16381.69	530.901	278.612	206.495	171.433
TOTAL 10 Dutch PAH	*mg/kg*		5606.052	836.302	543.29	834.123	3.15	11691.69	383.353	184.797	140.706	99.992
Easily-liberatable Cyanide	mg/kg		1	1	1	1	1	1	1	1	1	1
Complex Cyanide	mg/kg		31.4	11.3	61.1	99.5	13.9	99.8	66.5	980.3	83.4	20.9
Total Cyanide	mg/kg		31.4	11.3	61.5	99.8	13.19	66.5	980.3	83.4	123.4	20.9
Elemental Sulphur	mg/kg		50	50	50	50	52	50	1133	50	50	50
Exchangeable Ammonium	mg/kg	139	20.4	23.1	3	4.9	2.8	15.4	26.3	6.7	8.2	4.9
Arsenic	mg/kg	20	1	1	1	1	1	10	1	1	1	1
Cadmium	mg/kg		1	1	1	1	1	1	1	1	1	1
Chromium	mg/kg	130	13	14	15	17	11	1	2	3	4	13
Lead	mg/kg		126	152	2105	162	15	55	35	8	14	40
Mercury	mg/kg	15	1	1	1	1	1	7	2	1	1	5
Selenium	mg/kg	260	1	1	1	1	1	1	1	1	1	1
Copper	mg/kg	17	18	17	78	34	1	5	12	12	15	25
Nickel	mg/kg	75	15	15	24	21	9	4	19	19	20	28
Zinc	mg/kg	720	198	66	222	41	17	66	20	11	14	76
Boron	mg/kg		1	1	1	2	1	1	2	1	1	2
Benzene	mg/kg	0.00224	93.281	0.11	0.001	0.001	0.005	21.485	0.193	0.897	0.633	0.021
Toluene	mg/kg		111.123	0.422	0.002	0.001	0.001	37.209	0.126	0.786	0.616	0.004
Ethylbenzene	mg/kg	156000	25.392	0.185	0.001	0.001	0.001	19.4	0.074	0.113	0.098	0.002
Xylene	mg/kg	125	230.479	2.157	0.001	0.001	0.001	190.52	0.655	1.163	0.999	0.005
2-Isopropyl Phenol by HPLC	mg/kg		30.48	25.26	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	0.00224	125.96				0.011	47.346				
Ethylbenzene by GC	mg/kg		24.696				0.01	53.503				
Toluene by GC	mg/kg	156000	160.893				0.01	100.701				
Xylene by GC	mg/kg	125	201.314				0.01	417.514				
Chloride	mg/kg	68.4	170	150	20	25	50	120	50	115	255	100
Sulphate Soluble as SO4	mg/kg	67.8	635	275	1330	5070	520	255	665	550	305	7795
MTBE by GC	mg/kg		1.817				0.01	0.5				
Total TPH	mg/kg			712	9635	534			343	129	98	468

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

client sample ID Depth	Units	QRA	TT 101 2.70	TT 101 3.80	TT 102 2.00	TT 104 1.20	TT 52 EARTH	TT 53 1.00	TT 53 4.50	TT 54 0.50	TT 54 4.20	TT 54 E 0.60
pH	pH Units		7.52	8.2	8.13	7.73	7.48	7.54	7.86	7.18	6	8.46
% Loss on Ignition	%		12	3	4	7	1	9	4	39	17	16
% Moisture Content	%		14.6	12.7	14.7	13.7	8.4	21.9	37.9	19.4	27.5	13.1
% Stones	%		47.7	0.1	5	19	28.8	20.4	0.1	27.9	34.8	25.1
Cresols	mg/kg		0.02	0.14	0.02	0.46	0.01	2.27	0.01	0.64	0.82	1.74
Xylenols & Ethylphenols	mg/kg		0.22	0.24	0.03	0.01	0.01	2.29	0.01	1.5	1.14	4.65
Naphthols	mg/kg		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03
Phenol	mg/kg		0.01	0.04	0.01	0.75	0.01	0.64	0.01	0.13	0.68	0.88
Trimethylphenol	mg/kg		0.2	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.35
Total Phenols	mg/kg		0.47	0.47	0.1	1.28	0.01	5.19	0.01	2.48	2.89	10.1
Naphthalene	mg/kg		74.271	12.304	26.188	0.509	0.51	25.35	4.689	127.279	8.39	1249.912
Acenaphthylene	mg/kg		4.298	0.484	19.043	2.686	0.187	13.43	0.658	23.42	1.374	375.939
Acenaphthene	mg/kg		9.285	1.8	5.657	0.161	0.043	2.883	0.565	15.9	4.109	155.361
Fluorene	mg/kg		11.543	2.249	21.301	0.818	0.122	16.577	1.527	54.842	3.681	435.693
Phenanthrene	mg/kg		60.144	7.42	57.025	6.126	0.351	167.512	7.965	352.204	31.808	1036.478
Anthracene	mg/kg		10.637	2.078	9.357	8.438	0.128	55.068	2.691	89.242	9.25	334.663
Fluoranthene	mg/kg		70.145	5.507	8.656	11.921	0.363	157.269	7.799	312.509	81.974	678.309
Pyrene	mg/kg		49.932	3.976	12.328	13.991	0.312	114.899	5.662	352.486	72.696	402.853
Cyclopenta(cd)pyrene	mg/kg		7.91	0.001	0.626	2.893	0.058	3.867	0.322	28.508	14.704	81.054
Benzo(a)anthracene	mg/kg		37.412	1.808	1.353	6.635	0.149	97.01	4.703	114.266	58.769	248.18
Chrysene	mg/kg		41.789	1.662	2.063	6.669	0.146	62.216	3.1	115.988	57.59	193.98
Benzo(b)fluoranthene	mg/kg		101.982	3.194	1.597	8.024	0.132	99.397	6.114	110.149	83.64	232.88
Benzo(k)fluoranthene	mg/kg		17.059	0.999	0.349	3.354	0.069	21.059	1.133	36.557	32.341	70.656
Benzo(e)pyrene	mg/kg		36.584	1.384	0.95	5.498	0.087	39.493	1.893	56.969	49.829	109.388
Benzo(a)pyrene	mg/kg		39.318	2.25	0.889	6.241	0.081	58.691	2.761	61.951	63.876	145.136
Indeno(1/2/3-cd)pyrene	mg/kg		27.249	1.437	0.623	5.437	0.136	29.212	1.053	47.356	74.337	106.022
Di-benz(a/h)anthracene	mg/kg		10.285	0.436	0.179	1.511	0.04	7.055	0.329	12.346	19.977	33.637
Benzo(g/h/i)perylene	mg/kg		27.636	1.631	1.093	6.874	0.169	33.029	1.378	58.291	89.339	107.236
Anthanthrene	mg/kg		9.451	0.796	0.291	1.347	0.04	16.494	0.673	5.514	25.177	35.233
Total PAH	mg/kg		646.929	51.415	169.569	99.133	3.121	1020.51	55.015	1975.777	782.861	6032.608
TOTAL 10 Dutch PAH	*mg/kg*		405.66	37.096	107.596	62.204	2.101	706.416	37.272	1315.643	507.674	4170.572
Easily-liberatable Cyanide	mg/kg		1	1	1	1	1	1	1	4.86	1	1
Complex Cyanide	mg/kg		6	2.5	16.9	8.7	2.5	124.3	2.5	1149.1	402.5	79.1
Total Cyanide	mg/kg		6	2.5	16.86	8.67	2.5	124.3	2.5	1154	402.5	79.1
Elemental Sulphur	mg/kg		50	685	1095	158	50	50	237	55546	2701	50
Exchangeable Ammonium	mg/kg	139	28.1	56	9.1	8.3	7.9	11.3	22.7	134.3	10.1	5.3
Arsenic	mg/kg	20	1	1	46	48	45	1	1	12	102	116
Cadmium	mg/kg		1	1	4	1	1	1	1	1	1	3
Chromium	mg/kg	130	10	66	169	96	78	91	119	111	64	111
Lead	mg/kg		44	41	1513	1094	1747	273	47	333	1592	1969
Mercury	mg/kg	15	6	9	1	1	1	3	1	1	1	1
Selenium	mg/kg	260	1	1	1	1	1	1	1	1	1	1
Copper	mg/kg	17	25	21	217	109	136	150	32	126	178	387
Nickel	mg/kg	75	31	80	97	53	107	117	78	80	153	232
Zinc	mg/kg	720	55	76	1271	728	497	708	159	345	284	1504
Boron	mg/kg		2	2	1	1	1	1	1	2	1	1
Benzene	mg/kg	0.00224		0.163	0.954	0.001	0.001	0.001	0.011	0.005	1.312	0.012
Toluene	mg/kg			0.006	1.183	0.001	0.001	0.006	0.027	0.002	0.004	0.169
Ethylbenzene	mg/kg	156000		0.001	4.193	0.001	0.001	0.001	0.003	0.004	0.002	0.383
Xylene	mg/kg	125		0.013	4.203	0.001	0.001	0.001	0.02	0.028	0.008	10.985
2-Isopropyl Phenol by HPLC	mg/kg		0.01	0.01	0.03	0.06	0.01	0.01	0.01	0.21	0.14	2.46
Catechol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	0.00224	1.228							0.039		
Ethylbenzene by GC	mg/kg		0.32							0.07		
Toluene by GC	mg/kg	156000	0.294							0.017		
Xylene by GC	mg/kg	125	0.802							0.419		
Chloride	mg/kg	68.4	300	45	80	35	270	25	60	615	310	115
Sulphate Soluble as SO4	mg/kg	67.8	3685	210	115	230	43	4930	145	7915	1530	370
MTBE by GC	mg/kg		0.05							0.01		
Total TPH	mg/kg			10	25886	36	25	558	66	3931	139	5234

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

client sample ID Depth	Units	QRA	TT 55 0.60	TT 55 2.00	TT 56 0.30	TT 56 1.75	TT 57 1.00	TT 57 4.00	TT 58 1.00	TT 58 2.00	TT 59 1.30
pH	pH Units		7.24	7.78	6.3	8.23	7.39	6.9	8.28	8.79	7.05
% Loss on Ignition	%		12	11	5	6	8	2	10	9	12
% Moisture Content	%		17.5	34.2	9.2	12.5	13.5	12.2	26.2	23.8	8.6
% Stones	%		51.5	11.3	34.9	41.9	26.7	8.2	13.2	16.3	35.4
Cresols	mg/kg		0.01	32.59	0.01	0.01	0.01	0.12	0.06	0.01	0.22
Xylenols & Ethylphenols	mg/kg		0.01	0.01	0.01	0.02	0.01	0.04	0.01	0.01	0.02
Naphthols	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/kg		0.01	5.16	0.01	0.01	0.01	0.04	0.03	0.01	0.09
Trimethylphenol	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/kg		0.01	37.75	0.01	0.04	0.02	0.21	0.08	0.01	0.5
Naphthalene	mg/kg		29.182	3651.266	0.26	2.357	1.632	0.033	49.974	1.249	32.978
Acenaphthylene	mg/kg		10.521	239.141	0.523	4.868	1.362	0.029	4.807	0.696	27.831
Acenaphthene	mg/kg		15.201	759.413	0.073	0.958	0.261	0.008	0.644	0.705	5.868
Fluorene	mg/kg		21.831	922.376	0.301	2.204	0.674	0.011	2.742	0.668	20.671
Phenanthrene	mg/kg		76.964	2519.719	0.951	7.852	5.723	0.097	6.892	2.705	63.236
Anthracene	mg/kg		29.733	1113.534	0.406	3.639	2.308	0.072	2.463	1.018	22.819
Fluoranthene	mg/kg		94.365	1252.986	1.436	13.65	13.244	0.105	4.466	6.705	71.778
Pyrene	mg/kg		57.94	829.242	1.248	12.232	10.412	0.095	3.346	5.42	50.715
Cyclopenta(cd)pyrene	mg/kg		0.747	41.021	0.426	2.105	2.196	0.029	0.539	1.041	8.335
Benzo(a)anthracene	mg/kg		48.208	447.044	1.411	6.496	7.367	0.098	1.806	3.865	28.475
Chrysene	mg/kg		31.741	441.532	1.435	6.679	6.473	0.098	2.182	3.986	25.469
Benzo(b)fluoranthene	mg/kg		70.757	612.423	2	11.211	11.8	0.113	2.916	9.506	45.248
Benzo(k)fluoranthene	mg/kg		14.595	104.902	1.065	4.521	3.589	0.057	0.961	2.308	14.107
Benzo(e)pyrene	mg/kg		20.534	187.257	1.216	6.321	5.298	0.075	1.665	4.44	18.243
Benzo(a)pyrene	mg/kg		31.077	306.311	1.319	4.421	6.087	0.076	1.285	4.604	21.08
Indeno(1/2/3-cd)pyrene	mg/kg		16.025	140.816	1.534	7.452	6.237	0.098	2.64	5.952	21.72
Di-benz(a/h)anthracene	mg/kg		4.294	38.268	0.381	2.051	1.696	0.001	0.73	1.308	5.185
Benzo(g/h/i)perylene	mg/kg		17.036	152.554	1.855	8.616	6.643	0.096	2.889	6.419	23.635
Anthanthrene	mg/kg		7.635	87.515	0.255	0.754	2.328	0.001	0.673	1.102	4.977
Total PAH	mg/kg		598.387	13847.32	18.095	108.39	95.329	1.191	93.619	63.696	512.372
TOTAL 10 Dutch PAH	*mg/kg*		388.926	10130.66	11.672	65.683	59.303	0.83	75.558	38.811	325.297
Easily-liberatable Cyanide	mg/kg		2.47	1.2		1	1	1	1.02	2.39	1.78
Complex Cyanide	mg/kg		280.8	2042.2	4.1	10.8	2.5	19	106.5	114.3	115.8
Total Cyanide	mg/kg		283.3	2043.4	4.1	10.75	2.5	19.02	107.5	116.7	117.6
Elemental Sulphur	mg/kg		3036	50	50	211	50	50	50	196	72
Exchangeable Ammonium	mg/kg	139	10.3	48.1	2.3	6.8	3.2	13.3	10	4.3	33.2
Arsenic	mg/kg	20	8	1	3	54	41	49	16	38	85
Cadmium	mg/kg		4	4	1	5	3	4	1	2	1
Chromium	mg/kg	130	79	92	146	48	117	136	100	56	115
Lead	mg/kg		1632	434	127	674	905	1101	496	1522	130
Mercury	mg/kg	15	1	1	1	1	1	1	1	1	1
Selenium	mg/kg	260	1	1	1	1	1	1	1	1	1
Copper	mg/kg	17	644	28	178	152	159	217	102	128	70
Nickel	mg/kg	75	111	40	254	242	77	90	55	83	213
Zinc	mg/kg	720	1637	840	424	1116	1017	1275	423	1008	350
Boron	mg/kg		1	1	1	1	1	1	1	2	1
Benzene	mg/kg	0.00224	0.008	111.645	0.001	0.022	0.001	0.001	0.001	0.001	0.001
Toluene	mg/kg		0.019	401.893	0.001	0.03	0.001	0.001	0.001	0.001	0.002
Ethylbenzene	mg/kg	156000	0.03	89.473	0.001	0.017	0.001	0.001	0.001	0.001	0.001
Xylene	mg/kg	125	0.256	710.823	0.001	0.084	0.001	0.001	0.001	0.001	0.006
2-Isopropyl Phenol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/kg		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Benzene by GC	mg/kg	0.00224		38.959				0.01			
Ethylbenzene by GC	mg/kg			28.685				0.01			
Toluene by GC	mg/kg	156000		149.254				0.01			
Xylene by GC	mg/kg	125		182.698				0.01			
Chloride	mg/kg	68.4	170	130	20	50	40	85	30	545	475
Sulphate Soluble as SO4	mg/kg	67.8	5100	850	5395	7440	935	28	1190	1740	6595
MTBE by GC	mg/kg			0.445				0.01			
Total TPH	mg/kg		5128	26907	473	855	670	339	58	41	1261

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:39:02

For inspection purposes only.
Consent of copyright owner required for any other use.

Soil Chemical Results

TPH Results

EPA Export 29-05-2012:04:39:02

Sample Number	157	165	170	236	252	256	260	268	17	188	174	196
Sample Identity	BH35	BH35	BH38	BH39D	BH40	BH40	BH41C	BH41C	BH42	BH42	BH43	BH43
Depth	GL-1.2	3.4	0.6	4.5	4	5	3.5	5.5	2.0	5	0.6	2.05
Total Hydrocarbon	3500	405	380	1629	295	81	433	<10	25427	3710	17507	2151
Aliphatic												
>C8-C10	<100	<10	<10	<10	<10	<10	<10	<10	<200	<50	<50	<50
>C10-C16	<100	<10	<10	<10	<10	<10	<10	<10	487	61	4175	<50
>C16-C21	<100	<10	<10	20	<10	<10	<10	<10	1351	53	2402	118
>C21-C40	<100	73	17	27	47	22	25	<10	852	127	2210	222
Mineral oil content	<100	76	22	52	59	28	30	<10	2690	241	8827	352
Aromatic												
C8-C10	<100	<10	<10	<10	<10	<10	<10	<10	<200	<50	<50	<50
>C10-C16	<100	<10	<10	171	<10	<10	<10	<10	412	<50	67	<50
>C16-C21	<100	32	<10	171	<10	<10	13	<10	6091	91	243	<50
>C21-C40	<100	66	107	263	49	<10	78	21	7809	340	497	158
Aromatic content	<100	99	119	610	54	<10	93	24	14313	471	808	182
Total TPH(C8-C40)	<100	175	141	662	114	<10	123	24	17003	712	9635	534

For inspection purposes only.
Consent of copyright owner required for any other use.

all units in mg/kg

EPA Export 29-05-2012:04:39:02

Sample Number	206	210	211	215	222	84	80	116	23	33	128	132
Sample Identity	TT100	TT100	TT100 Dup	TT101	TT101	TT102	TT104	TT52	TT53	TT53	TT54	TT54 E
Depth	1.4	2.2	2.2	0.8	3.8	2	1.2	EARTH	1.0	4.5	4.2	0.6
Total Hydrocarbon	1635	601	566	1435	37	29697	157	134	3236	296	221	10705
Aliphatic												
>C8-C10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<10	<40
>C10-C16	17	<10	<10	15	<10	3799	<10	<10	78	<10	<10	<40
>C16-C21	27	<10	<10	104	<10	13749	<10	<10	201	10	<10	302
>C21-C40	25	<10	<10	128	<10	4687	<10	<10	151	11	<10	547
Mineral oil content	69	<10	<10	248	<10	22236	<10	<10	430	25	<10	877
Aromatic												
C8-C10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<10	<40
>C10-C16	<10	<10	<10	<10	<10	428	<10	<10	<50	<10	<11	70
>C16-C21	80	46	33	55	<10	2328	<10	<10	116	19	22	1620
>C21-C40	185	77	60	163	<10	892	26	14	<50	19	111	2676
Aromatic content	274	129	98	220	<10	3650	34	23	128	41	136	4367
Total TPH(C8-C40)	343	129	98	468	<10	25886	36	25	558	66	139	5243

all units in mg/kg

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Sample Number	38	136	144	88	100	104	108
Sample Identity	TT55	TT56	TT56	TT57	TT58	TT58	TT59
Depth	0.6	0.3	1.75	1	1	2	1.3
Total Hydrocarbon	8606	698	1526	616	150	71	2091
Aliphatic							
>C8-C10	<100	<40	<10	<10	<10	<10	<10
>C10-C16	207	<40	<10	76	<10	<10	<10
>C16-C21	629	260	195	382	<10	<10	124
>C21-C40	432	<40	230	178	<10	<10	620
Mineral oil content	1268	263	429	638	<10	<10	746
Aromatic							
C8-C10	<100	<40	<10	<10	<10	<10	<10
>C10-C16	160	<40	<10	<10	<10	<10	<10
>C16-C21	1006	74	95	18	11	<10	113
>C21-C40	2694	127	325	10	42	27	395
Aromatic content	3860	210	426	32	56	38	515
Total TPH(C8-C40)	5128	473	855	670	58	41	1261

all units in mg/kg

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

TPH CWG Soil

Sample Number	244+247	120+122	043+044	096+098
Client Ref:	BH39D	TT54	TT55	TT57
Depth	6.5	0.5	2.0	4.0
Aliphatics				
C5-C6	<10	<10	2851	<10
>C6-C8	305	<10	44739	<10
>C8-C10	1024	538	87012	<10
>C10-C12	3439	1961	121995	<10
>C12-C16	93648	414909	6798968	24598
>C16-C21	155787	385205	5198370	29610
>C21-C35	68631	366245	1094773	29441
Total Aliphatics	322834	1168858	13348708	83649
Aromatics				
C6-C7	236	39	38959	<10
>C7-C8	203	17	149254	<10
>C8-C10	2963	1295	341901	<10
>C10-C12	5158	2941	182993	<10
>C12-C16	132732	1580466	7140845	208098
>C16-C21	103144	851342	3749132	40167
>C21-C35	52938	326523	1955357	7025
Total Aromatics	297374	2762624	13558441	255290
PRO	13331	6801	970149	<10
TPH	620208	3931482	26907149	338939
MTBE	<10	<10	445	<10
Benzene	236	39	38959	<10
Toluene	203	17	149254	<10
Ethylbenzene	259	70	28685	<10
Xylene	1167	419	182698	<10

*TPH is the sum of Aliphatics and Aromatics (C5-C35)
all units in ug/kg

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

For inspection purposes only.
Consent of copyright owner required for any other use.

Leachate Chemical Results

Master Copy

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	Units	BH35 3.4	BH39D 6.5	BH42 3	BH43 4.2	IP04 0.4
pH	pH units	7.59	7.74	7.86	7.56	7.71
TOC	mg/l	20	40	1540	20	62
Conductivity (uS/cm)	uS/cm	99	275	209	127	136
Cresols	mg/l	<0.1	<0.1	486.7	<0.1	15.66
Xylenols & Ethylphenols	mg/l	<0.1	0.1	3549.2	<0.1	16.6
Naphthols	mg/l	<0.1	<0.1	0.8	<0.1	<0.01
Phenol	mg/l	<0.1	0.1	163.9	<0.1	6.14
Trimethylphenol	mg/l	<0.1	<0.1	<0.1	<0.1	<0.01
Total Phenols	mg/l	<0.1	0.1	1010.5	<0.1	38.45
Naphthalene	mg/l	0.0012	0.00408	48.19516	0.00132	1.419661
Acenaphthene	mg/l	0.00477	0.07173	0.38261	0.00013	0.071696
Fluorene	mg/l	0.00109	0.06419	0.88157	0.00043	0.051497
Phenanthrene	mg/l	0.00045	0.01196	0.61162	0.00028	0.049639
Anthracene	mg/l	0.00041	0.00499	0.20185	0.00101	0.014961
Fluoranthene	mg/l	0.00052	0.06364	0.09017	0.00027	0.007123
Pyrene	mg/l	0.00052	0.03329	0.06264	0.00039	0.004994
Benzo(a)anthracene	mg/l	0.00024	0.00352	0.01323	<0.0001	0.000563
Chrysene	mg/l	0.00013	0.0024	0.00599	<0.0001	0.000479
Benzo(b)fluoranthene	mg/l	<0.0001	0.00069	0.00356	<0.0001	0.000085
Benzo(k)fluoranthene	mg/l	<0.0001	0.00049	0.0011	<0.0001	0.000089
Benzo(e)pyrene	mg/l	<0.0001	0.00029	0.00101	<0.0001	0.000077
Benzo(a)pyrene	mg/l	<0.0001	0.00052	0.00168	<0.0001	0.000053
Indeno(1/2/3-cd)pyrene	mg/l	<0.0001	<0.0001	0.00066	<0.0001	<0.00001
Di-benz(a/h)anthracene	mg/l	<0.0001	<0.0001	0.0009	<0.0001	<0.00001
Benzo(g/h/l)perylene	mg/l	<0.0001	<0.0001	0.00078	<0.0001	<0.00001
Total PAH	mg/l	0.00933	0.26179	50.45454	0.00383	1.620916
Easily-liberatable Cyanide	mg/l	<5	<5	<5	<5	<0.5
Total Cyanide	mg/l	<5	<5	<5	<5	<0.5
Sulphate	mg/l	190.4	8	353.6	336	26.27
	mg/l					
Total Ammonium	mg/l	10	115	42	<2	1.8
Mercury Low Dutch T Leach	mg/l	<0.0005	<0.0005	<0.0005	<0.0005	<0.00005
Sulphide on Leachate	mg/l	<0.5	<0.5	0.8	<0.5	<0.05
Chloride Dionex Leachate	mg/l	5	19.9	39.92	5.02	9.64
Nitrate Dionex Leachate	mg/l	<1	<1	5	6	0.3
2-Isopropyl Phenol Leach HPLC	mg/l	<0.1	<0.1	<0.1	<0.1	<0.01
Catechol Leachate HPLC	mg/l	<0.1	<0.1	<0.1	<0.1	<0.01
Resorcinol Leachate HPLC	mg/l	<0.1	<0.1	<0.1	<0.1	0.05
Arsenic on Leachate by ICP-MS	mg/l	0.02	0.02	0.08	0.01	0.002
Cadmium on Leachate by ICP-MS	mg/l	<0.004	<0.004	<0.004	<0.004	<0.0004
Chromium on Leachate by ICP-MS	mg/l	0.04	<0.01	0.05	0.04	<0.001
Copper on Leachate by ICP-MS	mg/l	0.06	0.01	0.02	<0.01	0.061
Iron on Leachate by ICP-MS	mg/l	1.78	0.18	3.71	1.2	0.13
Nickel on Leachate by ICP-MS	mg/l	0.01	<0.01	0.01	<0.01	0.001
Lead on Leachate by ICP-MS	mg/l	0.01	<0.01	0.01	0.01	0.008
Selenium on Leachate by ICP-MS	mg/l	<0.01	0.01	0.01	0.01	0.001
Zinc on Leachate by ICP-MS	mg/l	0.17	0.49	<0.03	<0.03	0.092
Benzene by GC	mg/l	-	<0.1	27.2	<0.1	0.457
Ethylbenzene by GC	mg/l	-	<0.1	0.94	<0.1	0.099
Toluene by GC	mg/l	-	<0.1	15.36	<0.1	0.638
Xylene by GC	mg/l	-	<0.1	8.74	<0.1	0.861
MTBE by GC	mg/l	-	<0.1	0.1	<0.1	<0.05

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:02

Total TPH	mg/l	<0.05	0.069			7.184

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	*Units*	TT100 1.4	TT54 0.5	TT54E 0.6	TT55 2	TT58 1
pH	pH units	7.43	7.30	7.94	7.91	7.28
TOC	mg/l	50	80	170	62	20
Conductivity (uS/cm)	uS/cm	143	892	158	311	268
Cresols	mg/l	2.8	<0.1	<0.1	3.16	<0.1
Xylenols & Ethylphenols	mg/l	6.7	<0.1	<0.1	9.11	<0.1
Naphthols	mg/l	<0.1	<0.1	<0.1	<0.01	<0.1
Phenol	mg/l	0.4	<0.1	<0.1	0.35	<0.1
Trimethylphenol	mg/l	<0.1	<0.1	<0.1	<0.01	<0.1
Total Phenols	mg/l	9.8	<0.1	<0.1	12.62	<0.1
Naphthalene	mg/l	0.00307	0.02563	0.0152	1.767992	0.00692
Acenaphthene	mg/l	0.01184	0.04686	0.45983	0.140027	0.00607
Fluorene	mg/l	0.00309	0.0843	0.85464	0.105043	0.0044
Phenanthrene	mg/l	0.00104	0.03635	0.2062	0.100676	0.01131
Anthracene	mg/l	0.00203	0.01095	0.03255	0.031137	0.00301
Fluoranthene	mg/l	0.02669	0.0586	0.11019	0.019963	0.02147
Pyrene	mg/l	0.01732	0.03737	0.06085	0.013489	0.01218
Benzo(a)anthracene	mg/l	0.00191	0.00336	0.00994	0.004058	0.00387
Chrysene	mg/l	0.00147	0.00237	0.00717	0.004067	0.00483
Benzo(b)fluoranthene	mg/l	0.00034	0.00032	0.003	0.003117	0.00482
Benzo(k)fluoranthene	mg/l	0.00049	0.00024	0.00519	0.001393	0.0031
Benzo(e)pyrene	mg/l	0.00031	0.00029	0.00295	0.001382	0.00394
Benzo(a)pyrene	mg/l	0.0004	0.00017	0.004	0.001962	0.00398
Indeno(1/2/3-cd)pyrene	mg/l	<0.0001	<0.0001	0.00213	0.001229	0.00368
Di-benz(a/h)anthracene	mg/l	<0.0001	<0.0001	0.00066	0.000553	0.00107
Benzo(g/h/i)perylene	mg/l	<0.0001	<0.0001	0.00251	0.001341	0.00437
Total PAH	mg/l	0.06998	0.3068	1.77702	2.197431	0.09901
Easily-liberatable Cyanide	mg/l	<5	<5	<5	<0.5	<5
Total Cyanide	mg/l	<5	10.3	10	2.93	<5
Sulphate	mg/l	1097.7	821.6	130.2	84.75	1016
	mg/l					
Total Ammonium	mg/l	2	48	3	1.8	<2
Mercury Low Dutch T Leach	mg/l	<0.0005	<0.0005	<0.0005	<0.00005	0.0032
Sulphide on Leachate	mg/l	<0.5	<0.5	<0.5	<0.05	<0.5
Chloride Dionex Leachate	mg/l	2.9	3.51	1.91	0.372	3.91
Nitrate Dionex Leachate	mg/l	2	-	<1	<0.1	<1
2-Isopropyl Phenol Leach HPLC	mg/l	<0.1	<0.1	<0.1	<0.01	<0.1
Catechol Leachate HPLC	mg/l	<0.1	<0.1	<0.1	<0.01	<0.1
Resorcinol Leachate HPLC	mg/l	<0.1	<0.1	<0.1	<0.01	<0.1
Arsenic on Leachate by ICP-MS	mg/l	0.01	0.01	0.02	0.001	0.01
Cadmium on Leachate by ICP-MS	mg/l	<0.004	<0.004	<0.004	<0.0004	<0.004
Chromium on Leachate by ICP-MS	mg/l	<0.01	0.09	0.04	0.001	0.04
Copper on Leachate by ICP-MS	mg/l	0.52	0.04	0.05	0.001	0.03
Iron on Leachate by ICP-MS	mg/l	0.44	6.64	4.6	1.277	1.34
Nickel on Leachate by ICP-MS	mg/l	<0.01	0.07	0.02	0.001	0.01
Lead on Leachate by ICP-MS	mg/l	<0.01	0.02	0.02	0.001	0.01
Selenium on Leachate by ICP-MS	mg/l	<0.01	0.01	0.01	<0.001	<0.01
Zinc on Leachate by ICP-MS	mg/l	0.4	0.17	0.24	0.021	0.16
Benzene by GC	mg/l	-	<0.1	-	2.17	-
Ethylbenzene by GC	mg/l	-	<0.1	-	0.674	-
Toluene by GC	mg/l	-	<0.1	-	6.072	-
Xylene by GC	mg/l	-	0.11	-	5.158	-
MTBE by GC	mg/l	-	<0.1	-	<0.01	-

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:02

Total TPH	**mg/l**	<0.05	0.199	<0.05	27.302	<0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	*Units*	TT59 1.3
pH	pH units	7.27
TOC	mg/l	40
Conductivity (uS/cm)	uS/cm	550
Cresols	mg/l	<0.1
Xylenols & Ethylphenols	mg/l	<0.1
Naphthols	mg/l	<0.1
Phenol	mg/l	<0.1
Trimethylphenol	mg/l	<0.1
Total Phenols	mg/l	<0.1
Naphthalene	mg/l	0.00083
Acenaphthene	mg/l	0.00058
Fluorene	mg/l	0.00244
Phenanthrene	mg/l	0.00035
Anthracene	mg/l	0.00091
Fluoranthene	mg/l	0.00335
Pyrene	mg/l	0.00081
Benzo(a)anthracene	mg/l	0.00022
Chrysene	mg/l	0.00046
Benzo(b)fluoranthene	mg/l	0.00055
Benzo(k)fluoranthene	mg/l	0.00029
Benzo(e)pyrene	mg/l	0.0005
Benzo(a)pyrene	mg/l	0.00042
Indeno(1/2/3-cd)pyrene	mg/l	0.0004
Di-benz(a/h)anthracene	mg/l	0.00012
Benzo(g/h/l)perylene	mg/l	0.00042
Total PAH	mg/l	0.01263
Easily-liberatable Cyanide	mg/l	<5
Total Cyanide	mg/l	7.7
Sulphate	mg/l	1193.2
	mg/l	
Total Ammonium	mg/l	<2
Mercury Low Dutch T Leach	mg/l	<0.0005
Sulphide on Leachate	mg/l	<0.5
Chloride Dionex Leachate	mg/l	1.7
Nitrate Dionex Leachate	mg/l	<1
2-Isopropyl Phenol Leach HPLC	mg/l	<0.1
Catechol Leachate HPLC	mg/l	<0.1
Resorcinol Leachate HPLC	mg/l	<0.1
Arsenic on Leachate by ICP-MS	mg/l	0.01
Cadmium on Leachate by ICP-MS	mg/l	<0.004
Chromium on Leachate by ICP-MS	mg/l	0.04
Copper on Leachate by ICP-MS	mg/l	0.05
Iron on Leachate by ICP-MS	mg/l	3.9
Nickel on Leachate by ICP-MS	mg/l	0.02
Lead on Leachate by ICP-MS	mg/l	0.03
Selenium on Leachate by ICP-MS	mg/l	0.01
Zinc on Leachate by ICP-MS	mg/l	0.18
Benzene by GC	mg/l	-
Ethylbenzene by GC	mg/l	-
Toluene by GC	mg/l	-
Xylene by GC	mg/l	-
MTBE by GC	mg/l	-

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:02

Total TPH	mg/l	<0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

For inspection purposes only.
Consent of copyright owner required for any other use.

Leachate Chemical Results

Highlighted Copy

EPA Export 29-05-2012:04:39:02

Leachate Highlighted

Client Sample ID Depth	Units	Dutch	ICRCL / Other	BH35 3.4	BH39D 6.5	BH42 3	BH43 4.2
pH	pH units		<5.5 - >9.5	7.59	7.74	7.86	7.56
TOC	mg/l			20	40	1540	20
Conductivity (uS/cm)	uS/cm		1500	99	275	209	127
Cresols	mg/l	0.2		0.1	0.1	486.7	0.1
Xylenols & Ethylphenols	mg/l			0.1	0.1	3549.2	0.1
Naphthols	mg/l			0.1	0.1	0.8	0.1
Phenol	mg/l			0.1	0.1	163.9	0.1
Trimethylphenol	mg/l			0.1	0.1	0.1	0.1
Total Phenols	mg/l	2		0.1	0.1	1010.5	0.1
Naphthalene	mg/l			0.0012	0.00408	48.19516	0.00132
Acenaphthene	mg/l			0.00477	0.07173	0.38261	0.00013
Fluorene	mg/l			0.00109	0.06419	0.88157	0.00043
Phenanthrene	mg/l			0.00045	0.01196	0.61162	0.00028
Anthracene	mg/l			0.00041	0.00499	0.20185	0.00101
Fluoranthene	mg/l			0.00052	0.06364	0.09017	0.00027
Pyrene	mg/l			0.00052	0.03329	0.06264	0.00039
Benzo(a)anthracene	mg/l			0.00024	0.00352	0.01323	0.0001
Chrysene	mg/l			0.00013	0.0024	0.00599	0.0001
Benzo(b)fluoranthene	mg/l			0.0001	0.00069	0.00356	0.0001
Benzo(k)fluoranthene	mg/l			0.0001	0.00049	0.0011	0.0001
Benzo(e)pyrene	mg/l			0.0001	0.00029	0.00101	0.0001
Benzo(a)pyrene	mg/l			0.0001	0.00052	0.00168	0.0001
Indeno(1/2/3-cd)pyrene	mg/l			0.0001	0.0001	0.00066	0.0001
Di-benz(a/h)anthracene	mg/l			0.0001	0.0001	0.0009	0.0001
Benzo(g/h/l)perylene	mg/l			0.0001	0.0001	0.00078	0.0001
Total PAH	mg/l			0.00933	0.26179	50.45454	0.00383
Total 10 Dutch PAH	*mg/l*	*0.08175*		0.00335	0.0918	49.12224	0.00348
Easily-liberatable Cyanide	mg/l			5	5	5	5
Total Cyanide	mg/l	3		5	5	5	5
Sulphate	mg/l		250	190.4	8	353.6	336
Total Ammonium	mg/l	3		10	115	42	2
Mercury Low Dutch T Leach	mg/l	0.0003		0.0005	0.0005	0.0005	0.0005
Sulphide on Leachate	mg/l			0.5	0.5	0.8	0.5
Chloride Dionex Leachate	mg/l			5	19.9	39.92	5.02
Nitrate Dionex Leachate	mg/l			1	1	5	6
2-Isopropyl Phenol Leach HPLC	mg/l			0.1	0.1	0.1	0.1
Catechol Leachate HPLC	mg/l			0.1	0.1	0.1	0.1
Resorcinol Leachate HPLC	mg/l			0.1	0.1	0.1	0.1
Arsenic on Leachate by ICP-MS	mg/l	0.06		0.02	0.02	0.08	0.01
Cadmium on Leachate by ICP-MS	mg/l	0.006		0.004	0.004	0.004	0.004
Chromium on Leachate by ICP-MS	mg/l	0.03		0.04	0.01	0.05	0.04
Copper on Leachate by ICP-MS	mg/l	0.075		0.06	0.01	0.02	0.01
Iron on Leachate by ICP-MS	mg/l	0.2		1.78	0.18	3.71	1.2
Nickel on Leachate by ICP-MS	mg/l	0.075		0.01	0.01	0.01	0.01
Lead on Leachate by ICP-MS	mg/l	0.075		0.01	0.01	0.01	0.01
Selenium on Leachate by ICP-MS	mg/l		0.01	0.01	0.01	0.01	0.01
Zinc on Leachate by ICP-MS	mg/l	0.8		0.17	0.49	0.03	0.03
Benzene by GC	mg/l	0.03			0.1	27.2	0.1
Ethylbenzene by GC	mg/l	1			0.1	0.94	0.1
Toluene by GC	mg/l	0.15			0.1	15.36	0.1
Xylene by GC	mg/l	0.07			0.1	8.74	0.1
MTBE by GC	mg/l				0.1	0.1	0.1

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Total TPH	mg/l	0.15		0.05	0.069

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	Units	Dutch	ICRCL / Other	IP04 0.4	TT100 1.4	TT54 0.5	TT54E 0.6
pH	pH units		<5.5 - >9.5	7.71	7.43	7.3	7.94
TOC	mg/l			62	50	80	170
Conductivity (uS/cm)	uS/cm		1500	136	143	892	158
Cresols	mg/l	0.2		15.66	2.8	0.1	0.1
Xylenols & Ethylphenols	mg/l			16.6	6.7	0.1	0.1
Naphthols	mg/l			0.01	0.1	0.1	0.1
Phenol	mg/l			6.14	0.4	0.1	0.1
Trimethylphenol	mg/l			0.01	0.1	0.1	0.1
Total Phenols	mg/l	2		38.45	9.8	0.1	0.1
Naphthalene	mg/l			1.419661	0.00307	0.02563	0.0152
Acenaphthene	mg/l			0.071696	0.01184	0.04686	0.45983
Fluorene	mg/l			0.051497	0.00309	0.0843	0.85464
Phenanthrene	mg/l			0.049639	0.00104	0.03635	0.2062
Anthracene	mg/l			0.014961	0.00203	0.01095	0.03255
Fluoranthene	mg/l			0.007123	0.02669	0.0586	0.11019
Pyrene	mg/l			0.004994	0.01732	0.03737	0.06085
Benzo(a)anthracene	mg/l			0.000563	0.00191	0.00336	0.00994
Chrysene	mg/l			0.000479	0.00147	0.00237	0.00717
Benzo(b)fluoranthene	mg/l			0.000085	0.00034	0.00032	0.003
Benzo(k)fluoranthene	mg/l			0.000089	0.00049	0.00024	0.00519
Benzo(e)pyrene	mg/l			0.000077	0.00031	0.00029	0.00295
Benzo(a)pyrene	mg/l			0.000053	0.0004	0.00017	0.004
Indeno(1/2/3-cd)pyrene	mg/l			0.00001	0.0001	0.0001	0.00213
Di-benz(a/h)anthracene	mg/l			0.00001	0.0001	0.0001	0.00066
Benzo(g/h/l)perylene	mg/l			0.00001	0.0001	0.0001	0.00251
Total PAH	mg/l			1.620916	0.06998	0.3068	1.77702
Total 10 Dutch PAH	*mg/l*	*0.08175*		1.492588	0.0373	0.13787	0.39508
Easily-liberatable Cyanide	mg/l			0.5	5	5	5
Total Cyanide	mg/l	3		0.5	5	10.3	10
Sulphate	mg/l		250	26.27	1097.7	821.6	130.2
Total Ammonium	mg/l	3		1.8	2	48	3
Mercury Low Dutch T Leach	mg/l	0.0003		0.00005	0.0005	0.0005	0.0005
Sulphide on Leachate	mg/l			0.05	0.5	0.5	0.5
Chloride Dionex Leachate	mg/l			9.64	2.9	3.51	1.91
Nitrate Dionex Leachate	mg/l			0.3	2		1
2-Isopropyl Phenol Leach HPLC	mg/l			0.01	0.1	0.1	0.1
Catechol Leachate HPLC	mg/l			0.01	0.1	0.1	0.1
Resorcinol Leachate HPLC	mg/l			0.05	0.1	0.1	0.1
Arsenic on Leachate by ICP-MS	mg/l	0.06		0.002	0.01	0.01	0.02
Cadmium on Leachate by ICP-MS	mg/l	0.006		0.0004	0.004	0.004	0.004
Chromium on Leachate by ICP-MS	mg/l	0.03		0.001	0.01	0.09	0.04
Copper on Leachate by ICP-MS	mg/l	0.075		0.061	0.52	0.04	0.05
Iron on Leachate by ICP-MS	mg/l	0.2		0.13	0.44	6.64	4.6
Nickel on Leachate by ICP-MS	mg/l	0.075		0.001	0.01	0.07	0.02
Lead on Leachate by ICP-MS	mg/l	0.075		0.008	0.01	0.02	0.02
Selenium on Leachate by ICP-MS	mg/l		0.01	0.001	0.01	0.01	0.01
Zinc on Leachate by ICP-MS	mg/l	0.8		0.092	0.4	0.17	0.24
Benzene by GC	mg/l	0.03		0.457		0.1	
Ethylbenzene by GC	mg/l	1		0.099		0.1	
Toluene by GC	mg/l	0.15		0.638		0.1	
Xylene by GC	mg/l	0.07		0.861		0.11	
MTBE by GC	mg/l			0.05		0.1	

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Leachate Highlighted

Total TPH	mg/l	0.15		7.184	0.05	0.199	0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	Units	Dutch	ICRCL / Other	TT55 2	TT58 1	TT59 1.3
pH	pH units		<5.5 - >9.5	7.91	7.28	7.27
TOC	mg/l			62	20	40
Conductivity (uS/cm)	uS/cm		1500	311	268	550
Cresols	mg/l	0.2		3.16	0.1	0.1
Xylenols & Ethylphenols	mg/l			9.11	0.1	0.1
Naphthols	mg/l			0.01	0.1	0.1
Phenol	mg/l			0.35	0.1	0.1
Trimethylphenol	mg/l			0.01	0.1	0.1
Total Phenols	mg/l	2		12.62	0.1	0.1
Naphthalene	mg/l			1.767992	0.00692	0.00083
Acenaphthene	mg/l			0.140027	0.00607	0.00058
Fluorene	mg/l			0.105043	0.0044	0.00244
Phenanthrene	mg/l			0.100676	0.01131	0.00035
Anthracene	mg/l			0.031137	0.00301	0.00091
Fluoranthene	mg/l			0.019963	0.02147	0.00335
Pyrene	mg/l			0.013489	0.01218	0.00081
Benzo(a)anthracene	mg/l			0.004058	0.00387	0.00022
Chrysene	mg/l			0.004067	0.00483	0.00046
Benzo(b)fluoranthene	mg/l			0.003117	0.00482	0.00055
Benzo(k)fluoranthene	mg/l			0.001393	0.0031	0.00029
Benzo(e)pyrene	mg/l			0.001382	0.00394	0.0005
Benzo(a)pyrene	mg/l			0.001962	0.00398	0.00042
Indeno(1/2/3-cd)pyrene	mg/l			0.001229	0.00368	0.0004
Di-benz(a/h)anthracene	mg/l			0.000553	0.00107	0.00012
Benzo(g/h/l)perylene	mg/l			0.001341	0.00437	0.00042
Total PAH	mg/l			2.197431	0.09901	0.01263
Total 10 Dutch PAH	*mg/l*	*0.08175*		1.933818	0.06654	0.00765
Easily-liberatable Cyanide	mg/l			0.5	5	5
Total Cyanide	mg/l	3		2.93	5	7.7
Sulphate	mg/l		250	84.75	1016	1193.2
Total Ammonium	mg/l	3		1.8	2	2
Mercury Low Dutch T Leach	mg/l	0.0003		0.00005	0.0032	0.0005
Sulphide on Leachate	mg/l			0.05	0.5	0.5
Chloride Dionex Leachate	mg/l			0.372	3.91	1.7
Nitrate Dionex Leachate	mg/l			0.1	1	1
2-Isopropyl Phenol Leach HPLC	mg/l			0.01	0.1	0.1
Catechol Leachate HPLC	mg/l			0.01	0.1	0.1
Resorcinol Leachate HPLC	mg/l			0.01	0.1	0.1
Arsenic on Leachate by ICP-MS	mg/l	0.06		0.001	0.01	0.01
Cadmium on Leachate by ICP-MS	mg/l	0.006		0.0004	0.004	0.004
Chromium on Leachate by ICP-MS	mg/l	0.03		0.001	0.04	0.04
Copper on Leachate by ICP-MS	mg/l	0.075		0.001	0.03	0.05
Iron on Leachate by ICP-MS	mg/l	0.2		1.277	1.34	3.9
Nickel on Leachate by ICP-MS	mg/l	0.075		0.001	0.01	0.02
Lead on Leachate by ICP-MS	mg/l	0.075		0.001	0.01	0.03
Selenium on Leachate by ICP-MS	mg/l		0.01	0.001	0.01	0.01
Zinc on Leachate by ICP-MS	mg/l	0.8		0.021	0.16	0.18
Benzene by GC	mg/l	0.03		2.17		
Ethylbenzene by GC	mg/l	1		0.674		
Toluene by GC	mg/l	0.15		6.072		
Xylene by GC	mg/l	0.07		5.158		
MTBE by GC	mg/l			0.01		

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Total TPH	mg/l	0.15		27.302	0.05	0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

For inspection purposes only.
Consent of copyright owner required for any other use.

Leachate Chemical Results

QRA Highlighted Copy

EPA Export 29-05-2012:04:39:02

Leachate QRA Highlighted

Client Sample ID Depth	Units	QRA	BH35 3.4	BH39D 6.5	BH42 3	BH43 4.2	IP04 0.4
pH	pH units		7.59	7.74	7.86	7.56	7.71
TOC	mg/l		20	40	1540	20	62
Conductivity (uS/cm)	uS/cm		99	275	209	127	136
Cresols	mg/l		0.1	0.1	486.7	0.1	15.66
Xylenols & Ethylphenols	mg/l		0.1	0.1	3549.2	0.1	16.6
Naphthols	mg/l		0.1	0.1	0.8	0.1	0.01
Phenol	mg/l		0.1	0.1	163.9	0.1	6.14
Trimethylphenol	mg/l		0.1	0.1	0.1	0.1	0.01
Total Phenols	mg/l		0.1	0.1	1010.5	0.1	38.45
Naphthalene	mg/l		0.0012	0.00408	48.19516	0.00132	1.419661
Acenaphthene	mg/l		0.00477	0.07173	0.38261	0.00013	0.071696
Fluorene	mg/l		0.00109	0.06419	0.88157	0.00043	0.051497
Phenanthrene	mg/l		0.00045	0.01196	0.61162	0.00028	0.049639
Anthracene	mg/l		0.00041	0.00499	0.20185	0.00101	0.014961
Fluoranthene	mg/l		0.00052	0.06364	0.09017	0.00027	0.007123
Pyrene	mg/l		0.00052	0.03329	0.06264	0.00039	0.004994
Benzo(a)anthracene	mg/l		0.00024	0.00352	0.01323	0.0001	0.000563
Chrysene	mg/l		0.00013	0.0024	0.00599	0.0001	0.000479
Benzo(b)fluoranthene	mg/l		0.0001	0.00069	0.00356	0.0001	0.000085
Benzo(k)fluoranthene	mg/l		0.0001	0.00049	0.0011	0.0001	0.000089
Benzo(e)pyrene	mg/l		0.0001	0.00029	0.00101	0.0001	0.000077
Benzo(a)pyrene	mg/l		0.0001	0.00052	0.00168	0.0001	0.000053
Indeno(1/2/3-cd)pyrene	mg/l		0.0001	0.0001	0.00066	0.0001	0.00001
Di-benz(a/h)anthracene	mg/l		0.0001	0.0001	0.0009	0.0001	0.00001
Benzo(g/h/l)perylene	mg/l		0.0001	0.0001	0.00078	0.0001	0.00001
Total PAH	mg/l		0.00933	0.26179	50.45454	0.00383	1.620916
Total 10 Dutch PAH	*mg/l*		0.00335	0.0918	49.12224	0.00348	1.492588
Easily-liberatable Cyanide	mg/l		5	5	5	5	0.5
Total Cyanide	mg/l		5	5	5	5	0.5
Sulphate	mg/l	261	190.4	8	353.6	336	26.27
Total Ammonium	mg/l	456	10	115	42	2	1.8
Mercury Low Dutch T Leach	mg/l	0.00105	0.0005	0.0005	0.0005	0.0005	0.00005
Sulphide on Leachate	mg/l	0.000261	0.5	0.5	0.8	0.5	0.05
Chloride Dionex Leachate	mg/l	261	5	19.9	39.92	5.02	9.64
Nitrate Dionex Leachate	mg/l		1	1	5	6	0.3
2-Isopropyl Phenol Leach HPLC	mg/l		0.1	0.1	0.1	0.1	0.01
Catechol Leachate HPLC	mg/l		0.1	0.1	0.1	0.1	0.01
Resorcinol Leachate HPLC	mg/l		0.1	0.1	0.1	0.1	0.05
Arsenic on Leachate by ICP-MS	mg/l	0.0261	0.02	0.02	0.08	0.01	0.002
Cadmium on Leachate by ICP-MS	mg/l		0.004	0.004	0.004	0.004	0.0004
Chromium on Leachate by ICP-MS	mg/l	0.00314	0.04	0.01	0.05	0.04	0.001
Copper on Leachate by ICP-MS	mg/l	0.0314	0.06	0.01	0.02	0.01	0.061
Iron on Leachate by ICP-MS	mg/l		1.78	0.18	3.71	1.2	0.13
Nickel on Leachate by ICP-MS	mg/l	0.0523	0.01	0.01	0.01	0.01	0.001
Lead on Leachate by ICP-MS	mg/l		0.01	0.01	0.01	0.01	0.008
Selenium on Leachate by ICP-MS	mg/l	261	0.01	0.01	0.01	0.01	0.001
Zinc on Leachate by ICP-MS	mg/l	0.105	0.17	0.49	0.03	0.03	0.092
Benzene by GC	mg/l	0.0152		0.1	27.2	0.1	0.457
Ethylbenzene by GC	mg/l			0.1	0.94	0.1	0.099
Toluene by GC	mg/l			0.1	15.36	0.1	0.638
Xylene by GC	mg/l	13300		0.1	8.74	0.1	0.861
MTBE by GC	mg/l			0.1	0.1	0.1	0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Total TPH	mg/l		0.05	0.069	7.184

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	Units	QRA	TT100 1.4	TT54 0.5	TT54E 0.6	TT55 2	TT58 1
pH	pH units		7.43	7.3	7.94	7.91	7.28
TOC	mg/l		50	80	170	62	20
Conductivity (uS/cm)	uS/cm		143	892	158	311	268
Cresols	mg/l		2.8	0.1	0.1	3.16	0.1
Xylenols & Ethylphenols	mg/l		6.7	0.1	0.1	9.11	0.1
Naphthols	mg/l		0.1	0.1	0.1	0.01	0.1
Phenol	mg/l		0.4	0.1	0.1	0.35	0.1
Trimethylphenol	mg/l		0.1	0.1	0.1	0.01	0.1
Total Phenols	mg/l		9.8	0.1	0.1	12.62	0.1
Naphthalene	mg/l		0.00307	0.02563	0.0152	1.767992	0.00692
Acenaphthene	mg/l		0.01184	0.04686	0.45983	0.140027	0.00607
Fluorene	mg/l		0.00309	0.0843	0.85464	0.105043	0.0044
Phenanthrene	mg/l		0.00104	0.03635	0.2062	0.100676	0.01131
Anthracene	mg/l		0.00203	0.01095	0.03255	0.031137	0.00301
Fluoranthene	mg/l		0.02669	0.0586	0.11019	0.019963	0.02147
Pyrene	mg/l		0.01732	0.03737	0.06085	0.013489	0.01218
Benzo(a)anthracene	mg/l		0.00191	0.00336	0.00994	0.004058	0.00387
Chrysene	mg/l		0.00147	0.00237	0.00717	0.004067	0.00483
Benzo(b)fluoranthene	mg/l		0.00034	0.00032	0.003	0.003117	0.00482
Benzo(k)fluoranthene	mg/l		0.00049	0.00024	0.00519	0.001393	0.0031
Benzo(e)pyrene	mg/l		0.00031	0.00029	0.00295	0.001382	0.00394
Benzo(a)pyrene	mg/l		0.0004	0.00017	0.004	0.001962	0.00398
Indeno(1/2/3-cd)pyrene	mg/l		0.0003	0.0001	0.00213	0.001229	0.00368
Di-benz(a/h)anthracene	mg/l		0.0001	0.0001	0.00066	0.000553	0.00107
Benzo(g/h/l)perylene	mg/l		0.0001	0.0001	0.00251	0.001341	0.00437
Total PAH	mg/l		0.06998	0.3068	1.77702	2.197431	0.09901
Total 10 Dutch PAH	*mg/l*		0.0373	0.13787	0.39508	1.933818	0.06654
Easily-liberatable Cyanide	mg/l		5	5	5	0.5	5
Total Cyanide	mg/l		5	10.3	10	2.93	5
Sulphate	mg/l	261	1097.7	821.6	130.2	84.75	1016
Total Ammonium	mg/l	456	2	48	3	1.8	2
Mercury Low Dutch T Leach	mg/l	0.00105	0.0005	0.0005	0.0005	0.00005	0.0032
Sulphide on Leachate	mg/l	0.000261	0.5	0.5	0.5	0.05	0.5
Chloride Dionex Leachate	mg/l	261	2.9	3.51	1.91	0.372	3.91
Nitrate Dionex Leachate	mg/l		2		1	0.1	1
2-Isopropyl Phenol Leach HPLC	mg/l		0.1	0.1	0.1	0.01	0.1
Catechol Leachate HPLC	mg/l		0.1	0.1	0.1	0.01	0.1
Resorcinol Leachate HPLC	mg/l		0.1	0.1	0.1	0.01	0.1
Arsenic on Leachate by ICP-MS	mg/l	0.0261	0.01	0.01	0.02	0.001	0.01
Cadmium on Leachate by ICP-MS	mg/l		0.004	0.004	0.004	0.0004	0.004
Chromium on Leachate by ICP-MS	mg/l	0.00314	0.01	0.09	0.04	0.001	0.04
Copper on Leachate by ICP-MS	mg/l	0.0314	0.52	0.04	0.05	0.001	0.03
Iron on Leachate by ICP-MS	mg/l		0.44	6.64	4.6	1.277	1.34
Nickel on Leachate by ICP-MS	mg/l	0.0523	0.01	0.07	0.02	0.001	0.01
Lead on Leachate by ICP-MS	mg/l		0.01	0.02	0.02	0.001	0.01
Selenium on Leachate by ICP-MS	mg/l	261	0.01	0.01	0.01	0.001	0.01
Zinc on Leachate by ICP-MS	mg/l	0.105	0.4	0.17	0.24	0.021	0.16
Benzene by GC	mg/l	0.0152		0.1		2.17	
Ethylbenzene by GC	mg/l			0.1		0.674	
Toluene by GC	mg/l			0.1		6.072	
Xylene by GC	mg/l	13300		0.11		5.158	
MTBE by GC	mg/l			0.1		0.01	

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Total TPH	mg/l		0.05	0.199	0.05	27.302	0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:02

Client Sample ID Depth	Units	QRA	TT59 1.3
pH	pH units		7.27
TOC	mg/l		40
Conductivity (uS/cm)	uS/cm		550
Cresols	mg/l		0.1
Xylenols & Ethylphenols	mg/l		0.1
Naphthols	mg/l		0.1
Phenol	mg/l		0.1
Trimethylphenol	mg/l		0.1
Total Phenols	mg/l		0.1
Naphthalene	mg/l		0.00083
Acenaphthene	mg/l		0.00058
Fluorene	mg/l		0.00244
Phenanthrene	mg/l		0.00035
Anthracene	mg/l		0.00091
Fluoranthene	mg/l		0.00335
Pyrene	mg/l		0.00081
Benzo(a)anthracene	mg/l		0.00022
Chrysene	mg/l		0.00046
Benzo(b)fluoranthene	mg/l		0.00055
Benzo(k)fluoranthene	mg/l		0.00029
Benzo(e)pyrene	mg/l		0.0005
Benzo(a)pyrene	mg/l		0.00042
Indeno(1/2/3-cd)pyrene	mg/l		0.0004
Di-benz(a/h)anthracene	mg/l		0.00012
Benzo(g/h/l)perylene	mg/l		0.00042
Total PAH	mg/l		0.01263
Total 10 Dutch PAH	*mg/l*		0.00765
Easily-liberatable Cyanide	mg/l		5
Total Cyanide	mg/l		7.7
Sulphate	mg/l	261	1193.2
Total Ammonium	mg/l	456	2
Mercury Low Dutch T Leach	mg/l	0.00105	0.0005
Sulphide on Leachate	mg/l	0.000261	0.5
Chloride Dionex Leachate	mg/l	261	1.7
Nitrate Dionex Leachate	mg/l		1
2-Isopropyl Phenol Leach HPLC	mg/l		0.1
Catechol Leachate HPLC	mg/l		0.1
Resorcinol Leachate HPLC	mg/l		0.1
Arsenic on Leachate by ICP-MS	mg/l	0.0261	0.01
Cadmium on Leachate by ICP-MS	mg/l		0.004
Chromium on Leachate by ICP-MS	mg/l	0.00314	0.04
Copper on Leachate by ICP-MS	mg/l	0.0314	0.05
Iron on Leachate by ICP-MS	mg/l		3.9
Nickel on Leachate by ICP-MS	mg/l	0.0523	0.02
Lead on Leachate by ICP-MS	mg/l		0.03
Selenium on Leachate by ICP-MS	mg/l	261	0.01
Zinc on Leachate by ICP-MS	mg/l	0.105	0.18
Benzene by GC	mg/l	0.0152	
Ethylbenzene by GC	mg/l		
Toluene by GC	mg/l		
Xylene by GC	mg/l	13300	
MTBE by GC	mg/l		

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Total TPH	mg/l		0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

For inspection purposes only.
Consent of copyright owner required for any other use.

Leachate Chemical Results

TPH Results

EPA Export 29-05-2012:04:39:03

Sample Number	166	207	131	99	107
Sample Identity	BH35	TT100	TT54E	TT58	TT59
Depth	3.4	1.4	0.6	1	1.3
Total Hydrocarbon	343	424	9118	<50	<50
Aliphatic					
>C8-C10	<50	<50	<50	<50	<50
>C10-C16	<50	<50	<50	<50	<50
>C16-C21	<50	<50	<50	<50	<50
>C21-C40	<50	<50	<50	<50	<50
Mineral oil content	<50	<50	<50	<50	<50
Aromatic					
C8-C10	<50	<50	<50	<50	<50
>C10-C16	<50	<50	<50	<50	<50
>C16-C21	<50	<50	<50	<50	<50
>C21-C40	<50	<50	<50	<50	<50
Aromatic content	<50	<50	<50	<50	<50
Total TPH(C8-C40)	<50	<50	<50	<50	<50

All units in ug/l

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Sample Number	245+245	203+203	119+119	041+041
Client Ref:	BH39D	IP04	TT54	TT55
Depth	6.5	0.4	0.5	2.0
Aliphatics				
C5-C6	<10	<10	<10	<10
>C6-C8	<10	11	<10	59
>C8-C10	<10	58	<10	615
>C10-C12	<10	1568	<10	3454
>C12-C16	<10	304	10	1397
>C16-C21	<10	284	<10	90
>C21-C35	<10	87	<10	<10
Total Aliphatics	<10	2312	10	5614
Aromatics				
C6-C7	<10	457	<10	2170
>C7-C8	<10	638	<10	6072
>C8-C10	<10	1047	11	6754
>C10-C12	<10	2353	<10	5180
>C12-C16	59	377	178	1440
>C16-C21	10	<10	<10	52
>C21-C35	<10	<10	<10	19
Total Aromatics	69	4872	189	21688
PRO	<10	6132	11	24304
TPH	69	7184	199	27302
MTBE	<10	<10	<10	<10
Benzene	<10	457	<10	2170
Toluene	<10	638	<10	6072
Ethylbenzene	<10	99	<10	674
Xylene	<10	861	11	5158

*TPH is the sum of Aliphatics and Aromatics (C5-C35)
All units in ug/l

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

For inspection purposes only.
Consent of copyright owner required for any other use.

Water Chemical Results

Master Copy

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH31 2.52	BH31 B8	BH31 B9	BH32 1.2	BH32 B8
Sample date		20/08/2003	01/09/2003	16/09/03	20/08/2003	01/09/2003
pH	pH units	7.83	7.94	7.12	8.23	8.50
TOC	mg/l	27	692	29	9	12
Suspended solids	mg/l	2028	<10	17	1088	<10
Conductivity (uS/cm)	uS/cm	1172	1231	1173	475	477
Cresols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Xylenols & Ethylphenols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/l	0.000281	0.000463	0.00065	0.343692	0.001147
Acenaphthene	mg/l	0.001547	0.000536	0.003704	0.035828	0.017871
Fluorene	mg/l	0.000606	0.000147	0.001845	0.052158	0.022153
Phenanthrene	mg/l	0.000027	0.00003	0.000041	0.040824	0.006147
Anthracene	mg/l	0.000038	0.000017	0.00012	0.013038	0.004192
Fluoranthene	mg/l	0.000069	0.000045	0.000155	0.009697	0.004049
Pyrene	mg/l	0.000045	0.000035	0.000153	0.005183	0.002066
Benzo(a)anthracene	mg/l	<0.00001	0.000027	0.000032	0.001951	0.000474
Chrysene	mg/l	<0.00001	0.000013	0.000013	0.001254	0.000321
Benzo(b)fluoranthene	mg/l	<0.00001	0.000014	<0.00001	0.001748	0.000072
Benzo(k)fluoranthene	mg/l	<0.00001	0.000011	<0.00001	0.001117	0.000253
Benzo(e)pyrene	mg/l	<0.00001	<0.00001	<0.00001	0.000709	0.000117
Benzo(a)pyrene	mg/l	<0.00001	<0.00001	<0.00001	0.001041	0.000214
Indeno(1/2/3-cd)pyrene	mg/l	<0.00001	<0.00001	<0.00001	0.000514	0.000107
Di-benz(a/h)anthracene	mg/l	<0.00001	<0.00001	<0.00001	0.000234	0.000044
Benzo(g/h/i)perylene	mg/l	<0.00001	<0.00001	<0.00001	0.000524	0.000106
Total PAH	mg/l	0.002613	0.001338	0.006713	0.509511	0.059335
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	0.5	0.9	<0.5	<0.5	<0.5
Sulphate	mg/l	242	252	246	50	53
Sulphide	mg/l	<0.05	<0.05	0.05	<0.05	<0.05
Chloride	mg/l	51	42	29	25	23
Total Ammonium	mg/l	1.2	0.9	1.2	0.2	0.8
Benzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene	mg/l	<0.001	<0.001	<0.001	0.005	0.015
Mercury Low Dutch Target AA	mg/l	<0.00005	<0.00005	0.00006	<0.00005	<0.00005
Nitrate	mg/l	1.0	0.3	<0.3	0.7	0.3
2-Isopropyl Phenol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	0.024	0.109	0.072	0.165	0.151
Arsenic by ICP-MS	mg/l	0.004	0.004	0.004	0.011	0.008
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.002	0.001	0.003	0.002	0.001
Copper by ICP-MS	mg/l	0.005	0.004	0.003	0.002	0.001
Nickel by ICP-MS	mg/l	0.007	0.009	0.004	0.004	0.011
Lead by ICP-MS	mg/l	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	0.001	0.002	0.001	0.002	0.001
Zinc by ICP-MS	mg/l	0.025	0.046	0.026	0.014	0.063
Benzene by GC	mg/l	-	-	<0.01	-	-
Ethylbenzene by GC	mg/l	-	-	<0.01	-	-
Toluene by GC	mg/l	-	-	<0.01	-	-
Xylene by GC	mg/l	-	-	<0.01	-	-
MTBE by GC	mg/l	-	-	<0.01	-	-
Total TPH	mg/l	<0.05	<0.05	0.014	0.627	<0.05

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH32 B9	BH33 1.2	BH33 B8	BH33 B9	BH35 2.97
Sample date		16/09/03	20/08/2003	01/09/2003	16/09/03	20/08/2003
pH	pH units	7.30	8.08	8.19	7.02	7.99
TOC	mg/l	11	47	95	100	18
Suspended solids	mg/l	16	264	<10	14	464
Conductivity (uS/cm)	uS/cm	405	1002	1194	1178	1411
Cresols	mg/l	13.01	0.06	15.88	0.01	<0.01
Xylenols & Ethylphenols	mg/l	11.03	0.06	10.56	0.1	<0.01
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	9.35	0.04	10.41	<0.01	<0.01
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	33.39	0.17	36.86	0.11	<0.01
Naphthalene	mg/l	0.002044	0.085537	0.284058	0.27285	0.087859
Acenaphthene	mg/l	0.033303	0.012405	0.010854	0.013922	0.012243
Fluorene	mg/l	0.039498	0.04783	0.033702	0.022015	0.021714
Phenanthrene	mg/l	0.038047	0.03903	0.027364	0.035272	0.020385
Anthracene	mg/l	0.015077	0.016014	0.007894	0.010372	0.006763
Fluoranthene	mg/l	0.023354	0.017992	0.004335	0.021925	0.010229
Pyrene	mg/l	0.013649	0.010992	0.002577	0.014039	0.006314
Benzo(a)anthracene	mg/l	0.005025	0.007608	0.000637	0.007102	0.003923
Chrysene	mg/l	0.003813	0.004777	0.00038	0.005636	0.002657
Benzo(b)fluoranthene	mg/l	0.002449	0.00506	0.000067	0.005404	0.00547
Benzo(k)fluoranthene	mg/l	0.001925	0.00484	0.000282	0.004588	0.003179
Benzo(e)pyrene	mg/l	0.00197	0.002852	0.00016	0.003518	0.002054
Benzo(a)pyrene	mg/l	0.002729	0.004407	0.000206	0.005083	0.002851
Indeno(1/2/3-cd)pyrene	mg/l	0.001285	0.002219	0.000124	0.002541	0.001733
Di-benz(a/h)anthracene	mg/l	0.000378	0.001146	0.000097	0.000708	0.000785
Benzo(g/h/l)perylene	mg/l	0.001401	0.002038	0.000125	0.002915	0.001792
Total PAH	mg/l	0.185946	0.264745	0.372863	0.427889	0.189951
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	0.7
Sulphate	mg/l	42	190	182	192	580
Sulphide	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	mg/l	20	79	113	118	37
Total Ammonium	mg/l	0.9	25.1	47.0	45.9	18.2
Benzene	mg/l	16.664	8.244	7.4	7.912	0.017
Toluene	mg/l	6.11	3.57	3.22	3.145	0.006
Ethylbenzene	mg/l	0.408	0.255	0.086	0.028	0.036
Xylene	mg/l	3.903	2.861	2.017	1.917	0.277
Mercury Low Dutch Target AA	mg/l	0.00007	<0.00005	<0.00005	<0.00005	<0.00005
Nitrate	mg/l	0.4	0.5	0.22	<0.3	0.7
2-Isopropyl Phenol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	0.413	<0.005	0.15	0.555	0.204
Arsenic by ICP-MS	mg/l	0.01	0.009	0.007	0.011	0.005
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.001	0.005	0.003	0.006	0.002
Copper by ICP-MS	mg/l	<0.001	0.004	0.002	0.001	0.005
Nickel by ICP-MS	mg/l	0.001	0.01	0.014	0.014	0.007
Lead by ICP-MS	mg/l	0.001	<0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	<0.001	0.003	0.001	<0.001	0.004
Zinc by ICP-MS	mg/l	0.017	0.012	0.037	0.034	0.028
Benzene by GC	mg/l	<0.01	-	17.545	2.04	-
Ethylbenzene by GC	mg/l	<0.01	-	0.082	<0.05	-
Toluene by GC	mg/l	<0.01	-	5.047	0.636	-
Xylene by GC	mg/l	<0.01	-	1.879	0.268	-
MTBE by GC	mg/l	<0.01	-	<0.01	<0.05	-
Total TPH	mg/l	0.415	1.329	0.093	3.784	0.666

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH35 B8	BH35 B9	BH35A B8	BH35A B9	BH36 1.84
Sample date		01/09/2003	16/09/03	01/09/2003	16/09/03	20/08/2003
pH	pH units	8.01	7.21	8.00	7.18	8.27
TOC	mg/l	22	21	17	20	25
Suspended solids	mg/l	16	76	24	33	4752
Conductivity (uS/cm)	uS/cm	1675	1615	1540	1725	1109
Cresols	mg/l	9.78	0.01	<0.01	<0.01	<0.01
Xylenols & Ethylphenols	mg/l	20.77	0.11	0.04	0.18	<0.01
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	3.55	0.01	<0.01	<0.01	<0.01
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	34.11	0.14	0.04	0.29	<0.01
Naphthalene	mg/l	0.085752	6.749088	0.008813	0.026872	0.003889
Acenaphthene	mg/l	0.004055	0.032639	0.002274	0.015105	0.063819
Fluorene	mg/l	0.01052	0.11433	0.00384	0.025097	0.030366
Phenanthrene	mg/l	0.023212	0.101499	0.005156	0.017269	0.02234
Anthracene	mg/l	0.00795	0.029541	0.001519	0.008041	0.007328
Fluoranthene	mg/l	0.015128	0.034134	0.002139	0.010521	0.005075
Pyrene	mg/l	0.009722	0.022571	0.001254	0.006639	0.006558
Benzo(a)anthracene	mg/l	0.005096	0.008232	0.00048	0.002443	0.001458
Chrysene	mg/l	0.003629	0.00606	0.000335	0.001808	0.001035
Benzo(b)fluoranthene	mg/l	0.005185	0.004054	0.000147	0.001556	0.000831
Benzo(k)fluoranthene	mg/l	0.003175	0.003538	0.000332	0.00141	0.000765
Benzo(e)pyrene	mg/l	0.002348	0.003368	0.000208	0.001055	0.000586
Benzo(a)pyrene	mg/l	0.003232	0.005154	0.000287	0.001483	0.001026
Indeno(1/2/3-cd)pyrene	mg/l	0.001793	0.002495	0.000162	0.000686	0.000395
Di-benz(a/h)anthracene	mg/l	0.000723	0.000691	0.000091	0.000226	0.000168
Benzo(g/h/i)perylene	mg/l	0.001921	0.002822	0.000189	0.000846	0.000544
Total PAH	mg/l	0.183441	7.129271	0.027226	0.121056	0.146182
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	0.9	0.7	0.8	0.8	<0.5
Sulphate	mg/l	575	573	539	657	292
Sulphide	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	mg/l	41	33	34	37	33
Total Ammonium	mg/l	21.0	16.2	15.9	18.2	2.8
Benzene	mg/l	0.917	0.504	0.595	0.48	<0.001
Toluene	mg/l	0.167	0.057	0.048	0.037	<0.001
Ethylbenzene	mg/l	0.222	0.125	0.063	0.035	<0.001
Xylene	mg/l	0.771	0.302	0.171	0.185	<0.001
Mercury Low Dutch Target AA	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nitrate	mg/l	0.78	0.6	0.23	0.5	0.8
2-Isopropyl Phenol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	0.311	0.332	0.522	0.646	<0.005
Arsenic by ICP-MS	mg/l	0.003	0.005	0.003	0.003	0.008
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.002	0.006	0.001	0.004	0.006
Copper by ICP-MS	mg/l	0.001	<0.001	<0.001	0.001	0.005
Nickel by ICP-MS	mg/l	0.003	0.002	0.005	0.008	0.007
Lead by ICP-MS	mg/l	<0.001	0.001	<0.001	0.001	<0.001
Selenium by ICP-MS	mg/l	<0.001	0.003	0.01	0.002	0.01
Zinc by ICP-MS	mg/l	0.007	0.02	0.015	0.018	0.018
Benzene by GC	mg/l	-	0.768	-	0.283	<0.01
Ethylbenzene by GC	mg/l	-	0.092	-	<0.01	<0.01
Toluene by GC	mg/l	-	0.089	-	0.025	<0.01
Xylene by GC	mg/l	-	0.252	-	0.146	<0.01
MTBE by GC	mg/l	-	<0.01	-	<0.01	<0.01
Total TPH	mg/l	1.6	2.235	<0.05	0.146	1.986

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH36 B8	BH36 B9	BH36A 2.46	BH36A B8	BH36A B9
Sample date		01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units	7.91	7.29	8.10	8.43	7.13
TOC	mg/l	33	31	20	20	20
Suspended solids	mg/l	24	73	1640	<10	31
Conductivity (uS/cm)	uS/cm	1330	1329	1246	1472	1344
Cresols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Xylenols & Ethylphenols	mg/l	0.09	0.21	<0.01	<0.01	<0.01
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	0.09	0.21	<0.01	<0.01	<0.01
Naphthalene	mg/l	0.000797	0.001732	0.0012	0.000292	0.000686
Acenaphthene	mg/l	0.010122	0.079758	0.02314	0.009183	0.004201
Fluorene	mg/l	0.001751	0.024343	0.00686	0.001102	0.000677
Phenanthrene	mg/l	0.000416	0.003719	0.001993	0.00005	0.000259
Anthracene	mg/l	0.000419	0.004134	0.000761	0.000116	0.000255
Fluoranthene	mg/l	0.000821	0.003215	0.000646	0.0002	0.001698
Pyrene	mg/l	0.00086	0.004429	0.000443	0.000141	0.001333
Benzo(a)anthracene	mg/l	0.000237	0.000901	0.00012	0.000047	0.000314
Chrysene	mg/l	0.000168	0.000683	0.00009	0.000023	0.000205
Benzo(b)fluoranthene	mg/l	0.000169	0.000323	0.000063	<0.00001	0.000061
Benzo(k)fluoranthene	mg/l	0.000133	0.000329	0.000086	0.000015	0.000138
Benzo(e)pyrene	mg/l	0.000078	0.000296	0.000048	<0.00001	0.000087
Benzo(a)pyrene	mg/l	0.000141	0.000496	0.000054	<0.00001	0.000111
Indeno(1/2/3-cd)pyrene	mg/l	0.000057	0.000137	0.000041	<0.00001	0.000043
Di-benz(a/h)anthracene	mg/l	0.000023	0.000097	0.000015	<0.00001	0.000031
Benzo(g/h/l)perylene	mg/l	0.000078	0.00021	0.000047	<0.00001	0.000058
Total PAH	mg/l	0.016271	0.124804	0.035605	0.011168	0.010159
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphate	mg/l	271	261	400	410	380
Sulphide	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	mg/l	31	29	34	38	31
Total Ammonium	mg/l	4.9	6.1	8.5	9.5	10.2
Benzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene	mg/l	<0.001	<0.001	<0.001	<0.001	0.008
Mercury Low Dutch Target AA	mg/l	0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nitrate	mg/l	0.25	0.6	0.6	0.4	0.3
2-Isopropyl Phenol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	0.197	0.253	0.21	0.115	0.397
Arsenic by ICP-MS	mg/l	0.009	0.003	0.017	0.008	0.013
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.001	0.006	0.002	0.001	0.004
Copper by ICP-MS	mg/l	0.001	0.001	0.004	0.001	0.001
Nickel by ICP-MS	mg/l	0.008	0.004	0.007	0.005	0.006
Lead by ICP-MS	mg/l	<0.001	0.001	<0.001	<0.001	0.001
Selenium by ICP-MS	mg/l	<0.001	<0.001	0.003	0.001	0.001
Zinc by ICP-MS	mg/l	0.008	0.021	0.019	0.011	0.02
Benzene by GC	mg/l	-	<0.01	-	-	<0.01
Ethylbenzene by GC	mg/l	-	<0.01	-	-	<0.01
Toluene by GC	mg/l	-	<0.01	-	-	<0.01
Xylene by GC	mg/l	-	<0.01	-	-	0.018
MTBE by GC	mg/l	-	<0.01	-	-	<0.01
Total TPH	mg/l	<0.05	0.186	<0.05	<0.05	0.174

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH37 B8	BH37 B9	BH37A B8	BH37A B9	BH38 9.73
Sample date		01/09/2003	16/09/03	01/09/2003	16/09/03	20/08/2003
pH	pH units	8.27	7.19	8.19	7.39	7.54
TOC	mg/l	34	154	78	65	248
Suspended solids	mg/l	68	15	<10	<10	8410
Conductivity (uS/cm)	uS/cm	813	1459	1018	1039	ndp
Cresols	mg/l	0.71	37.66	14.06	11.56	1.92
Xylenols & Ethylphenols	mg/l	0.32	12.33	3.26	11.13	1.43
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	0.54	48.76	20.85	6	1.36
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	1.57	107.52	38.18	32.47	4.83
Naphthalene	mg/l	0.381225	0.074108	0.0042	3.283746	1.304606
Acenaphthene	mg/l	0.014593	0.003682	0.004062	0.017551	0.179215
Fluorene	mg/l	0.052403	0.006268	0.012455	0.058464	0.659971
Phenanthrene	mg/l	0.069609	0.01471	0.018979	0.050757	1.003547
Anthracene	mg/l	0.022771	0.003535	0.008194	0.01472	0.573582
Fluoranthene	mg/l	0.029049	0.009937	0.016018	0.010684	0.780186
Pyrene	mg/l	0.019304	0.00831	0.009685	0.007229	0.606318
Benzo(a)anthracene	mg/l	0.010424	0.004081	0.005388	0.001773	0.514131
Chrysene	mg/l	0.006873	0.003486	0.003905	0.001228	0.358777
Benzo(b)fluoranthene	mg/l	0.007518	0.003482	0.006433	0.000613	0.415653
Benzo(k)fluoranthene	mg/l	0.006959	0.002573	0.003507	0.000642	0.355949
Benzo(e)pyrene	mg/l	0.004008	0.002336	0.002244	0.000551	0.291635
Benzo(a)pyrene	mg/l	0.005997	0.003312	0.003254	0.00087	0.382959
Indeno(1/2/3-cd)pyrene	mg/l	0.003054	0.00155	0.001641	0.00034	0.203381
Di-benz(a/h)anthracene	mg/l	0.001343	0.00058	0.000682	0.000098	0.107265
Benzo(g/h/i)perylene	mg/l	0.003215	0.00199	0.00183	0.000405	0.195363
Total PAH	mg/l	0.638347	0.143904	0.102477	3.44967	7.932538
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	1.3
Sulphate	mg/l	122	198	149	149	463
Sulphide	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	mg/l	45	207	135	365	299
Total Ammonium	mg/l	26.4	85.3	29.7	24.9	48.8
Benzene	mg/l	0.579	1.674	2.425	4.637	10.853
Toluene	mg/l	0.524	0.351	1.574	2.744	5.3
Ethylbenzene	mg/l	0.035	0.351	0.141	2.744	0.324
Xylene	mg/l	0.132	0.125	1.414	2.171	3.525
Mercury Low Dutch Target AA	mg/l	<0.00005	<0.00005	0.00007	<0.00005	<0.00005
Nitrate	mg/l	0.4	<0.3	0.22	<0.3	<0.3
2-Isopropyl Phenol by HPLC	mg/l	<0.01	8.78	<0.01	3.78	0.12
Catechol by HPLC	mg/l	<0.01	<0.01	0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	0.054	0.106	0.103	0.198	0.467
Arsenic by ICP-MS	mg/l	0.01	0.003	0.003	0.012	0.007
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.004	0.004	0.005	0.006	0.007
Copper by ICP-MS	mg/l	0.001	0.005	0.001	<0.001	0.005
Nickel by ICP-MS	mg/l	0.004	0.001	0.002	0.004	0.006
Lead by ICP-MS	mg/l	<0.001	0.001	<0.001	0.001	<0.001
Selenium by ICP-MS	mg/l	0.017	0.003	0.007	0.019	0.01
Zinc by ICP-MS	mg/l	0.028	0.017	0.019	0.014	0.016
Benzene by GC	mg/l	-	2.645	-	5.964	-
Ethylbenzene by GC	mg/l	-	<0.01	-	0.128	-
Toluene by GC	mg/l	-	0.451	-	2.643	-
Xylene by GC	mg/l	-	0.126	-	1.335	-
MTBE by GC	mg/l	-	<0.01	-	<0.01	-
Total TPH	mg/l	0.541	4.068	0.169	13.899	2.436

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH38 B8	BH38 B9	BH38A 4.62	BH38A B8	BH38A B9
Sample date		01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units	8.60	9.59	8.01	7.66	9.12
TOC	mg/l	28	683	568	316	398
Suspended solids	mg/l	<10	67	1200	<10	21
Conductivity (uS/cm)	uS/cm	4020	4020	3780	2020	2540
Cresols	mg/l	128.17	200.17	139.27	54.2	98.5
Xylenols & Ethylphenols	mg/l	17.58	107.39	65.87	31.2	78.44
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	13604	139.6	142.09	43.11	54.9
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	290.12	487.89	347.23	129	271.61
Naphthalene	mg/l	0.124298	0.445696	0.462302	0.170803	8.319944
Acenaphthene	mg/l	0.004925	0.004491	0.018603	0.004025	0.030335
Fluorene	mg/l	0.008284	0.007409	0.048648	0.014741	0.099125
Phenanthrene	mg/l	0.016164	0.009612	0.079368	0.028776	0.144792
Anthracene	mg/l	0.004141	0.00337	0.025429	0.010051	0.04879
Fluoranthene	mg/l	0.00617	0.00364	0.043489	0.016737	0.078701
Pyrene	mg/l	0.00451	0.002665	0.02897	0.011013	0.054105
Benzo(a)anthracene	mg/l	0.002203	0.000997	0.016973	0.005936	0.023077
Chrysene	mg/l	0.001531	0.000564	0.010656	0.004189	0.017982
Benzo(b)fluoranthene	mg/l	0.002169	0.00064	0.021634	0.001779	0.013149
Benzo(k)fluoranthene	mg/l	0.001561	0.000411	0.011278	0.004007	0.009443
Benzo(e)pyrene	mg/l	0.001285	0.000354	0.007973	0.002629	0.009865
Benzo(a)pyrene	mg/l	0.00142	0.000513	0.011669	0.003688	0.015033
Indeno(1/2/3-cd)pyrene	mg/l	0.000687	0.000234	0.006571	0.001901	0.00659
Di-benz(a/h)anthracene	mg/l	0.000304	0.000198	0.003054	0.000753	0.001846
Benzo(g/h/i)perylene	mg/l	0.000893	0.000296	0.006477	0.00224	0.007786
Total PAH	mg/l	0.180546	0.48109	0.803033	0.283267	8.880565
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	2.3	2.2	2.2	1.8	2.1
Sulphate	mg/l	0.79	997	967	544	716
Sulphide	mg/l	<0.05	<0.05	<0.05	0.05	<0.05
Chloride	mg/l	983	52	628	346	662
Total Ammonium	mg/l	568.6	514.2	455.2	64.9	152.3
Benzene	mg/l	6.366	12.05	16.221	8.729	969.958
Toluene	mg/l	1.641	5.281	5.412	4.763	1007.852
Ethylbenzene	mg/l	0.068	0.3	0.268	0.356	175.504
Xylene	mg/l	0.001	3.393	3.261	0.006	1590.72
Mercury Low Dutch Target AA	mg/l	<0.00005	<0.00005	<0.00005	0.00014	<0.00005
Nitrate	mg/l	2.75	0.5	0.8	0.18	0.4
2-Isopropyl Phenol by HPLC	mg/l	<0.01	40.73	<0.01	<0.01	39.77
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	0.09	<0.01
Resorcinol by HPLC	mg/l	7.98	<0.01	<0.01	0.4	<0.01
Iron by ICP-MS	mg/l	1.372	1.47	1.268	0.987	1.304
Arsenic by ICP-MS	mg/l	0.093	0.069	0.032	0.02	0.026
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.057	0.048	0.042	0.007	0.016
Copper by ICP-MS	mg/l	0.018	0.019	0.051	0.004	0.004
Nickel by ICP-MS	mg/l	0.031	0.031	0.022	0.002	0.008
Lead by ICP-MS	mg/l	<0.001	0.001	0.001	<0.001	0.004
Selenium by ICP-MS	mg/l	0.021	0.025	0.035	0.013	0.016
Zinc by ICP-MS	mg/l	0.014	0.028	0.037	0.01	0.027
Benzene by GC	mg/l	14.408	18.253	20.5	23.098	18.618
Ethylbenzene by GC	mg/l	0.085	0.296	0.393	0.377	1.163
Toluene by GC	mg/l	2.955	6.474	7.016	8.725	11.612
Xylene by GC	mg/l	0.831	3.269	2.706	3.501	9.94
MTBE by GC	mg/l	0.01	<0.05	1.125	0.027	0.087
Total TPH	mg/l	0.868	36.551	45.642	0.165	61.075

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / Depth	Units	BH39 B8	BH39 B9	BH40 B8	BH40 B9	BH41C B8
Sample date		01/09/2003	16/09/03	01/09/2003	16/09/03	01/09/2003
pH	pH units	7.99	6.90	8.33	11.75	8.14
TOC	mg/l	48	34	85	56	31
Suspended solids	mg/l	30	41	<10	88	16
Conductivity (uS/cm)	uS/cm	2620	1872	1522	2180	1288
Cresols	mg/l	35.07	4.63	<0.01	0.12	1.08
Xylenols & Ethylphenols	mg/l	50.2	4.01	<0.01	<0.01	1.08
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	13.93	2.38	<0.01	0.14	0.44
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	99.11	12.37	<0.01	0.27	2.7
Naphthalene	mg/l	0.040949	0.576602	0.011512	0.004843	0.486479
Acenaphthene	mg/l	0.01406	0.051542	0.001769	0.001921	0.018558
Fluorene	mg/l	0.031075	0.098435	0.001528	0.001724	0.023588
Phenanthrene	mg/l	0.044719	0.133527	0.001613	0.002757	0.022167
Anthracene	mg/l	0.013938	0.039326	0.00029	0.000489	0.005808
Fluoranthene	mg/l	0.021579	0.108676	0.000446	0.000976	0.007392
Pyrene	mg/l	0.013831	0.075198	0.000257	0.000583	0.004604
Benzo(a)anthracene	mg/l	0.006932	0.032024	0.000067	0.000082	0.002545
Chrysene	mg/l	0.00496	0.023547	0.000048	0.000059	0.001878
Benzo(b)fluoranthene	mg/l	0.006236	0.023928	0.000025	0.000024	0.003886
Benzo(k)fluoranthene	mg/l	0.005071	0.019069	0.000025	0.000019	0.001732
Benzo(e)pyrene	mg/l	0.003235	0.014213	0.000018	0.000015	0.001231
Benzo(a)pyrene	mg/l	0.004431	0.020061	0.000019	0.000017	0.001686
Indeno(1/2/3-cd)pyrene	mg/l	0.002499	0.010751	<0.00001	<0.00001	0.000962
Di-benz(a/h)anthracene	mg/l	0.001001	0.003098	<0.00001	<0.00001	0.000385
Benzo(g/h/i)perylene	mg/l	0.002682	0.010853	0.000012	<0.00001	0.0011
Total PAH	mg/l	0.217198	1.240853	0.01764	0.013508	0.584
Easily-liberatable Cyanide	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	1.5	1.9	<0.5	<0.5	3.3
Sulphate	mg/l	1197	98	56	453	468
Sulphide	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	mg/l	36	495	617	26	55
Total Ammonium	mg/l	29.0	13.0	88.0	79.8	16.2
Benzene	mg/l	1.608	0.612	0.002	0.001	1.434
Toluene	mg/l	1.5	0.347	0.002	0.001	1.56
Ethylbenzene	mg/l	0.383	0.166	0.002	0.001	0.731
Xylene	mg/l	2.534	0.815	3.189	0.001	5.654
Mercury Low Dutch Target AA	mg/l	0.00013	<0.00005	0.00005	<0.00005	0.00007
Nitrate	mg/l	0.4	0.5	8.4	1.9	0.32
2-Isopropyl Phenol by HPLC	mg/l	<0.01	1.35	<0.01	<0.01	<0.01
Catechol by HPLC	mg/l	0.04	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	0.06	<0.01	<0.01	<0.01	0.1
Iron by ICP-MS	mg/l	0.228	0.277	0.119	0.147	1.36
Arsenic by ICP-MS	mg/l	0.01	0.006	0.004	0.003	0.018
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.003	0.006	0.011	0.009	0.001
Copper by ICP-MS	mg/l	0.001	0.002	0.033	0.019	0.001
Nickel by ICP-MS	mg/l	0.005	0.004	0.025	0.023	0.003
Lead by ICP-MS	mg/l	0.001	<0.001	<0.001	0.002	<0.001
Selenium by ICP-MS	mg/l	0.001	<0.001	0.005	0.003	0.003
Zinc by ICP-MS	mg/l	0.006	0.024	0.005	0.016	0.013
Benzene by GC	mg/l	-	1.205	-	<0.01	-
Ethylbenzene by GC	mg/l	-	0.189	-	<0.01	-
Toluene by GC	mg/l	-	0.473	-	<0.01	-
Xylene by GC	mg/l	-	0.894	-	<0.01	-
MTBE by GC	mg/l	-	<0.01	-	<0.01	-
Total TPH	mg/l	0.34	7.27	<0.05	1.532	0.379

For inspection purposes only. Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH41C B9	BH42 B8	BH42 B9	BH43 B8	BH43 B9
Sample date		16/09/03	01/09/2003	16/09/03	01/09/2003	16/09/03
pH	pH units	7.46	8.98	9.71	8.03	7.36
TOC	mg/l	31	2013	1969	15	16
Suspended solids	mg/l	20	42	96	<10	194
Conductivity (uS/cm)	uS/cm	1340	4860	4940	1744	1491
Cresols	mg/l	1.65	3.07	522.84	<0.01	2.01
Xylenols & Ethylphenols	mg/l	3.68	2.47	235.58	0.01	0.79
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	0.46	2.71	382.18	<0.01	1.5
Trimethylphenol	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	mg/l	8.9	8.26	1162.59	0.01	4.3
Naphthalene	mg/l	3.306788	0.05504	0.140798	0.000232	0.000614
Acenaphthene	mg/l	0.015425	0.002636	0.017996	0.007651	0.018542
Fluorene	mg/l	0.020234	0.006034	0.033248	0.000248	0.001029
Phenanthrene	mg/l	0.013994	0.00465	0.022117	0.000077	0.000076
Anthracene	mg/l	0.00289	0.001625	0.007088	0.00022	0.000275
Fluoranthene	mg/l	0.001796	0.001408	0.00252	0.00051	0.000827
Pyrene	mg/l	0.001058	0.000883	0.001958	0.00012	0.000374
Benzo(a)anthracene	mg/l	0.000201	0.000491	<0.00001	0.000061	0.00004
Chrysene	mg/l	0.0001	0.000316	<0.00001	0.000051	0.000018
Benzo(b)fluoranthene	mg/l	0.000027	0.00017	<0.00001	0.000014	<0.00001
Benzo(k)fluoranthene	mg/l	0.000033	0.000272	<0.00001	0.000043	<0.00001
Benzo(e)pyrene	mg/l	0.00002	0.000167	<0.00001	0.000033	<0.00001
Benzo(a)pyrene	mg/l	0.000036	0.000248	<0.00001	0.000037	<0.00001
Indeno(1/2/3-cd)pyrene	mg/l	0.000014	0.000133	<0.00001	0.000025	<0.00001
Di-benz(a/h)anthracene	mg/l	0.000012	0.000051	<0.00001	<0.00001	<0.00001
Benzo(g/h/i)perylene	mg/l	0.000017	0.000122	<0.00001	0.00003	<0.00001
Total PAH	mg/l	3.362644	0.074246	0.225725	0.009352	0.021796
Easily-liberatable Cyanide	mg/l	<0.5	4.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	2.5	17.5	11.2	1.2	0.7
Sulphate	mg/l	718	1118	1284	825	770
Sulphide	mg/l	<0.05	0.09	<0.05	<0.05	<0.05
Chloride	mg/l	44	664	794	33	35
Total Ammonium	mg/l	14.1	256.0	282.8	2.1	2.9
Benzene	mg/l	1.829	8.516	10.546	<0.001	<0.001
Toluene	mg/l	1.651	4.015	4.75	<0.001	<0.001
Ethylbenzene	mg/l	0.787	0.296	0.289	<0.001	<0.001
Xylene	mg/l	6.551	2.405	2.454	0.375	<0.001
Mercury Low Dutch Target AA	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nitrate	mg/l	0.4	5.19	0.4	0.3	0.6
2-Isopropyl Phenol by HPLC	mg/l	2.61	<0.01	21.99	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	0.943	6.112	8.32	0.296	0.434
Arsenic by ICP-MS	mg/l	0.013	0.067	0.127	0.002	0.004
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.005	0.016	0.025	0.001	0.002
Copper by ICP-MS	mg/l	0.001	0.008	0.006	0.003	0.003
Nickel by ICP-MS	mg/l	0.003	0.081	0.068	0.007	0.004
Lead by ICP-MS	mg/l	<0.001	0.001	0.001	<0.001	<0.001
Selenium by ICP-MS	mg/l	<0.001	0.046	0.055	<0.001	<0.001
Zinc by ICP-MS	mg/l	0.015	0.012	0.067	0.014	0.04
Benzene by GC	mg/l	2.102	19.407	16.221	-	<0.01
Ethylbenzene by GC	mg/l	0.614	0.259	0.332	-	<0.01
Toluene by GC	mg/l	1.994	6.051	5.618	-	<0.01
Xylene by GC	mg/l	4.976	2.488	2.809	-	<0.01
MTBE by GC	mg/l	0.023	0.045	<0.02	-	<0.01
Total TPH	mg/l	20.442	21.737	36.958	-	0.027

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	BH7 B8	BH7 B9	TT101 3.5	TT54 3.8	TT55 3.2
Sample date		01/09/03	16/09/03	30/07/03	30/07/03	15/08/03
pH	pH units	8.59	9.24	7.82	7.75	7.68
TOC	mg/l	135	110	23	19	4
Suspended solids	mg/l	102	49	290	512	276
Conductivity (uS/cm)	uS/cm	3360	3290	1784	1701	ndp
Cresols	mg/l	2.66	1.2	<0.01	0.02	17.89
Xylenols & Ethylphenols	mg/l	2.7	2.51	0.05	<0.01	<0.01
Naphthols	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenol	mg/l	0.68	0.32	<0.01	<0.01	4.79
Trimethylphenol	mg/l	<0.01	<0.01	0.01	<0.01	<0.01
Total Phenols	mg/l	6.04	4.03	0.07	0.02	22.67
Naphthalene	mg/l	0.646531	0.493635	0.019001	0.029572	6.440862
Acenaphthene	mg/l	0.01809	0.019163	0.00396	0.025057	0.474681
Fluorene	mg/l	0.069522	0.057296	0.007293	0.004782	0.529709
Phenanthrene	mg/l	0.12256	0.062102	0.013896	0.007191	0.972581
Anthracene	mg/l	0.041071	0.017855	0.004571	0.00189	0.30411
Fluoranthene	mg/l	0.067632	0.02184	0.010069	0.004604	0.450161
Pyrene	mg/l	0.042363	0.015948	0.006625	0.004097	0.306281
Benzo(a)anthracene	mg/l	0.024671	0.006658	0.003204	0.002266	0.14066
Chrysene	mg/l	0.016983	0.004645	0.002574	0.002829	0.112885
Benzo(b)fluoranthene	mg/l	0.018301	0.003958	0.001931	0.00667	0.083258
Benzo(k)fluoranthene	mg/l	0.016737	0.003934	0.001839	0.001726	0.075323
Benzo(e)pyrene	mg/l	0.00968	0.002557	0.001387	0.002315	0.06441
Benzo(a)pyrene	mg/l	0.013966	0.003921	0.002149	0.002661	0.091992
Indeno(1/2/3-cd)pyrene	mg/l	0.006841	0.001757	0.000931	0.002143	0.046595
Di-benz(a/h)anthracene	mg/l	0.003148	0.000629	0.000353	0.000853	0.01758
Benzo(g/h/l)perylene	mg/l	0.00726	0.001988	0.000972	0.002854	0.05498
Total PAH	mg/l	1.125355	0.717888	0.080755	0.10151	10.166067
Easily-liberatable Cyanide	mg/l	0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide	mg/l	21.7	15.5	0.5	1.3	<0.5
Sulphate	mg/l	1444	1563	728	789	962
Sulphide	mg/l	1.97	1.99	<0.05	<0.05	<0.05
Chloride	mg/l	461	640	28	35	62
Total Ammonium	mg/l	18.0	20.5	20.4	6.3	7.5
Benzene	mg/l	4.829	2.394	0.313	<0.001	5.347
Toluene	mg/l	2.875	1.262	0.025	<0.001	8.824
Ethylbenzene	mg/l	0.319	0.147	0.09	<0.001	0.884
Xylene	mg/l	2.939	1.538	0.283	0.009	7.469
Mercury Low Dutch Target AA	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Nitrate	mg/l	0.98	<0.3	0.7	0.9	0.67
2-Isopropyl Phenol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Iron by ICP-MS	mg/l	4.855	5.957	3.69	0.469	3.72
Arsenic by ICP-MS	mg/l	0.02	0.03	0.006	0.013	0.011
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.009	0.007	0.01	0.002	0.003
Copper by ICP-MS	mg/l	0.003	0.008	0.002	<0.001	0.002
Nickel by ICP-MS	mg/l	0.019	0.019	0.012	0.005	0.007
Lead by ICP-MS	mg/l	<0.001	0.001	0.009	<0.001	0.001
Selenium by ICP-MS	mg/l	0.005	0.006	<0.001	0.002	0.004
Zinc by ICP-MS	mg/l	0.083	0.121	0.05	<0.003	<0.003
Benzene by GC	mg/l	10.647	4.558	-	-	5.628
Ethylbenzene by GC	mg/l	0.262	0.227	-	-	0.874
Toluene by GC	mg/l	4.292	1.753	-	-	8.984
Xylene by GC	mg/l	2.55	1.606	-	-	6.654
MTBE by GC	mg/l	<0.01	<0.1	-	-	<0.01
Total TPH	mg/l	0.239	10.456	0.123	<0.05	72.832

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	TT58 3	TT59 3.4
Sample date		31/07/03	30/07/03
pH	pH units	7.98	7.93
TOC	mg/l	23	16
Suspended solids	mg/l	80	22
Conductivity (uS/cm)	uS/cm	1905	1218
Cresols	mg/l	<0.01	<0.01
Xylenols & Ethylphenols	mg/l	<0.01	0.13
Naphthols	mg/l	<0.01	<0.01
Phenol	mg/l	<0.01	<0.01
Trimethylphenol	mg/l	<0.01	<0.01
Total Phenols	mg/l	<0.01	0.13
Naphthalene	mg/l	0.249089	0.222348
Acenaphthene	mg/l	0.48011	0.023335
Fluorene	mg/l	0.357307	0.028184
Phenanthrene	mg/l	0.548016	0.048069
Anthracene	mg/l	0.046985	0.015022
Fluoranthene	mg/l	0.135588	0.028098
Pyrene	mg/l	0.09739	0.017591
Benzo(a)anthracene	mg/l	0.023485	0.009065
Chrysene	mg/l	0.019869	0.008061
Benzo(b)fluoranthene	mg/l	0.012207	0.014527
Benzo(k)fluoranthene	mg/l	0.006053	0.004294
Benzo(e)pyrene	mg/l	0.007574	0.00363
Benzo(a)pyrene	mg/l	0.011469	0.004717
Indeno(1/2/3-cd)pyrene	mg/l	0.004509	0.002932
Di-benz(a/h)anthracene	mg/l	0.0019	0.001396
Benzo(g/h/i)perylene	mg/l	0.005534	0.003189
Total PAH	mg/l	2.007086	0.434456
Easily-liberatable Cyanide	mg/l	<0.5	<0.5
Total Cyanide	mg/l	1.4	2.1
Sulphate	mg/l	1142	559
Sulphide	mg/l	<0.05	<0.05
Chloride	mg/l	27	37
Total Ammonium	mg/l	0.7	2.0
Benzene	mg/l	0.011	0.099
Toluene	mg/l	0.003	0.012
Ethylbenzene	mg/l	0.004	0.021
Xylene	mg/l	0.012	0.095
Mercury Low Dutch Target AA	mg/l	0.00005	<0.00005
Nitrate	mg/l	3.7	3.8
2-Isopropyl Phenol by HPLC	mg/l	<0.01	<0.01
Catechol by HPLC	mg/l	<0.01	<0.01
Resorcinol by HPLC	mg/l	<0.01	<0.01
Iron by ICP-MS	mg/l	0.746	4.128
Arsenic by ICP-MS	mg/l	0.011	0.007
Cadmium by ICP-MS	mg/l	<0.0004	<0.0004
Chromium by ICP-MS	mg/l	0.003	0.007
Copper by ICP-MS	mg/l	0.002	0.001
Nickel by ICP-MS	mg/l	0.006	0.014
Lead by ICP-MS	mg/l	0.047	0.059
Selenium by ICP-MS	mg/l	0.001	0.001
Zinc by ICP-MS	mg/l	0.005	0.02
Benzene by GC	mg/l	-	-
Ethylbenzene by GC	mg/l	-	-
Toluene by GC	mg/l	-	-
Xylene by GC	mg/l	-	-
MTBE by GC	mg/l	-	-
Total TPH	mg/l	0.496	1.884

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

For inspection purposes only.
Consent of copyright owner required for any other use.

Water Chemical Results

Highlighted Copy

EPA Export 29-05-2012:04:39:03

Water Highlighted

Client Sample ID / *Depth*	*Units*	*Dutch*	*ICRCL / Other*	BH31 2.52	BH31 B8	BH31 B9	BH32 1.2	BH32 B8
Sample date				20/08/2003	01/09/2003	16/09/03	20/08/2003	01/09/2003
pH	pH units		<5.5 - >9.5	7.83	7.94	7.12	8.23	8.5
TOC	mg/l			27	692	29	9	12
Suspended solids	mg/l			2028	10	17	1088	10
Conductivity (uS/cm)	uS/cm		1500	1172	1231	1173	475	477
Cresols	mg/l	0.2		0.01	0.01	0.01	0.01	0.01
Xylenols & Ethylphenols	mg/l			0.01	0.01	0.01	0.01	0.01
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		0.01	0.01	0.01	0.01	0.01
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			0.01	0.01	0.01	0.01	0.01
Naphthalene	mg/l			0.000281	0.000463	0.00065	0.343692	0.001147
Acenaphthene	mg/l			0.001547	0.000536	0.003704	0.035828	0.017871
Fluorene	mg/l			0.000606	0.000147	0.001845	0.052158	0.022153
Phenanthrene	mg/l			0.000027	0.00003	0.000041	0.040824	0.006147
Anthracene	mg/l			0.000038	0.000017	0.00012	0.013038	0.004192
Fluoranthene	mg/l			0.000069	0.000045	0.000155	0.009697	0.004049
Pyrene	mg/l			0.000045	0.000035	0.000153	0.005183	0.002066
Benzo(a)anthracene	mg/l			0.00001	0.000027	0.000032	0.001951	0.000474
Chrysene	mg/l			0.00001	0.000013	0.000013	0.001254	0.000321
Benzo(b)fluoranthene	mg/l			0.00001	0.000014	0.00001	0.001748	0.000072
Benzo(k)fluoranthene	mg/l			0.00001	0.000011	0.00001	0.001117	0.000253
Benzo(e)pyrene	mg/l			0.00001	0.00001	0.00001	0.000709	0.000117
Benzo(a)pyrene	mg/l			0.00001	0.00001	0.00001	0.001041	0.000214
Indeno(1/2/3-cd)pyrene	mg/l			0.00001	0.00001	0.00001	0.000514	0.000107
Di-benz(a/h)anthracene	mg/l			0.00001	0.00001	0.00001	0.000234	0.000044
Benzo(g/h/l)perylene	mg/l			0.00001	0.00001	0.00001	0.000524	0.000106
Total PAH	mg/l			0.002613	0.001338	0.006713	0.509511	0.059335
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.000475*	*0.000636*	*0.001051*	*0.413652*	*0.01701*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		0.5	0.9	0.5	0.5	0.5
Sulphate	mg/l		250	242	252	246	50	53
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			51	42	29	25	23
Total Ammonium	mg/l	3		1.2	0.9	1.2	0.2	0.8
Benzene	mg/l	0.03		0.001	0.001	0.001	0.001	0.001
Toluene	mg/l	1		0.001	0.001	0.001	0.001	0.001
Ethylbenzene	mg/l	0.15		0.001	0.001	0.001	0.001	0.001
Xylene	mg/l	0.07		0.001	0.001	0.001	0.005	0.015
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00006	0.00005	0.00005
Nitrate	mg/l			1	0.3	0.3	0.7	0.3
2-Isopropyl Phenol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	0.024	0.109	0.072	0.165	0.151
Arsenic by ICP-MS	mg/l	0.06		0.004	0.004	0.004	0.011	0.008
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.002	0.001	0.003	0.002	0.001
Copper by ICP-MS	mg/l	0.075		0.005	0.004	0.003	0.002	0.001
Nickel by ICP-MS	mg/l	0.075		0.007	0.009	0.004	0.004	0.011
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.001	0.002	0.001	0.002	0.001
Zinc by ICP-MS	mg/l	0.8		0.025	0.046	0.026	0.014	0.063
Benzene by GC	mg/l	0.03				0.01		
Ethylbenzene by GC	mg/l	1				0.01		
Toluene by GC	mg/l	0.15				0.01		
Xylene by GC	mg/l	0.07				0.01		
MTBE by GC	mg/l					0.01		
Total TPH	mg/l	0.15		0.05	0.05	0.014	0.627	0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID				BH32	BH33	BH33	BH33	BH35
Depth	*Units*	*Dutch*	*ICRCL / Other*	B9	1.2	B8	B9	2.97
Sample date				16/09/03	20/08/2003	01/09/2003	16/09/03	20/08/2003
pH	pH units		<5.5 - >9.5	7.3	8.08	8.19	7.02	7.99
TOC	mg/l			11	47	95	100	18
Suspended solids	mg/l			16	264	10	14	464
Conductivity (uS/cm)	uS/cm		1500	405	1002	1194	1178	1411
Cresols	mg/l	0.2		13.01	0.06	15.88	0.01	0.01
Xylenols & Ethylphenols	mg/l			11.03	0.06	10.56	0.1	0.01
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		9.35	0.04	10.41	0.01	0.01
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			33.39	0.17	36.86	0.11	0.01
Naphthalene	mg/l			0.002044	0.085537	0.284058	0.27285	0.087859
Acenaphthene	mg/l			0.033303	0.012405	0.010854	0.013922	0.012243
Fluorene	mg/l			0.039498	0.04783	0.033702	0.022015	0.021714
Phenanthrene	mg/l			0.038047	0.03903	0.027364	0.035272	0.020385
Anthracene	mg/l			0.015077	0.016014	0.007894	0.010372	0.006763
Fluoranthene	mg/l			0.023354	0.017992	0.004335	0.021925	0.010229
Pyrene	mg/l			0.013649	0.010992	0.002577	0.014039	0.006314
Benzo(a)anthracene	mg/l			0.005025	0.007608	0.000637	0.007102	0.003923
Chrysene	mg/l			0.003813	0.004777	0.00038	0.005636	0.002657
Benzo(b)fluoranthene	mg/l			0.002449	0.00506	0.000067	0.005404	0.00547
Benzo(k)fluoranthene	mg/l			0.001925	0.00484	0.000282	0.004588	0.003179
Benzo(e)pyrene	mg/l			0.00197	0.002852	0.00016	0.003518	0.002054
Benzo(a)pyrene	mg/l			0.002729	0.004407	0.000206	0.005083	0.002851
Indeno(1/2/3-cd)pyrene	mg/l			0.001285	0.002219	0.000124	0.002541	0.001733
Di-benz(a/h)anthracene	mg/l			0.000378	0.001146	0.000097	0.000708	0.000785
Benzo(g/h/i)perylene	mg/l			0.001401	0.002038	0.000125	0.002915	0.001792
Total PAH	mg/l			0.185946	0.264745	0.372863	0.427889	0.189951
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.0947*	*0.184462*	*0.325405*	*0.368284*	*0.141371*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		0.5	0.5	0.5	0.5	0.7
Sulphate	mg/l		250	42	190	182	192	580
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			20	79	113	118	37
Total Ammonium	mg/l	3		0.9	25.1	47	45.9	18.2
Benzene	mg/l	0.03		10.664	8.244	7.4	7.912	0.017
Toluene	mg/l	1		6.11	3.57	3.22	3.145	0.006
Ethylbenzene	mg/l	0.15		0.408	0.255	0.086	0.028	0.036
Xylene	mg/l	0.07		3.903	2.861	2.017	1.917	0.277
Mercury Low Dutch Target AA	mg/l	0.0003		0.00007	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l			0.4	0.5	0.22	0.3	0.7
2-Isopropyl Phenol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	0.413	0.005	0.15	0.555	0.204
Arsenic by ICP-MS	mg/l	0.06		0.01	0.009	0.007	0.011	0.005
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.001	0.005	0.003	0.006	0.002
Copper by ICP-MS	mg/l	0.075		0.001	0.004	0.002	0.001	0.005
Nickel by ICP-MS	mg/l	0.075		0.001	0.01	0.014	0.014	0.007
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.001	0.003	0.001	0.001	0.004
Zinc by ICP-MS	mg/l	0.8		0.017	0.012	0.037	0.034	0.028
Benzene by GC	mg/l	0.03		0.01		17.545	2.04	
Ethylbenzene by GC	mg/l	1		0.01		0.082	0.05	
Toluene by GC	mg/l	0.15		0.01		5.047	0.636	
Xylene by GC	mg/l	0.07		0.01		1.879	0.268	
MTBE by GC	mg/l			0.01		0.01	0.05	
Total TPH	mg/l	0.15		0.415	1.329	0.093	3.784	0.666

For inspection purposes only. Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	*Dutch*	*ICRCL / Other*	BH35 B8	BH35 B9	BH35A B8	BH35A B9	BH36 1.84
Sample date				01/09/2003	16/09/03	01/09/2003	16/09/03	20/08/2003
pH	pH units		<5.5 - >9.5	8.01	7.21	8	7.18	8.27
TOC	mg/l			22	21	17	20	25
Suspended solids	mg/l			16	76	24	33	4752
Conductivity (uS/cm)	uS/cm		1500	1675	1615	1540	1725	1109
Cresols	mg/l	0.2		9.78	0.01	0.01	0.01	0.01
Xylenols & Ethylphenols	mg/l			20.77	0.11	0.04	0.18	0.01
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		3.55	0.01	0.01	0.01	0.01
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			34.11	0.14	0.04	0.29	0.01
Naphthalene	mg/l			0.085752	6.749088	0.008813	0.026872	0.003889
Acenaphthene	mg/l			0.004055	0.032639	0.002274	0.015105	0.063819
Fluorene	mg/l			0.01052	0.11433	0.00384	0.025097	0.030366
Phenanthrene	mg/l			0.023212	0.101499	0.005156	0.017269	0.02234
Anthracene	mg/l			0.00795	0.029541	0.001519	0.008041	0.007328
Fluoranthene	mg/l			0.015128	0.034134	0.002139	0.010521	0.005075
Pyrene	mg/l			0.009722	0.022571	0.001254	0.006639	0.006558
Benzo(a)anthracene	mg/l			0.005096	0.008232	0.00048	0.002443	0.001458
Chrysene	mg/l			0.003629	0.00606	0.000335	0.001808	0.001035
Benzo(b)fluoranthene	mg/l			0.005185	0.004054	0.000147	0.001556	0.000831
Benzo(k)fluoranthene	mg/l			0.003175	0.003538	0.000332	0.00141	0.000765
Benzo(e)pyrene	mg/l			0.002348	0.003368	0.000208	0.001055	0.000586
Benzo(a)pyrene	mg/l			0.003232	0.005154	0.000287	0.001483	0.001026
Indeno(1/2/3-cd)pyrene	mg/l			0.001793	0.002495	0.000162	0.000686	0.000395
Di-benz(a/h)anthracene	mg/l			0.000723	0.000691	0.000091	0.000226	0.000168
Benzo(g/h/l)perylene	mg/l			0.001921	0.002822	0.000189	0.000846	0.000544
Total PAH	mg/l			0.183441	7.120217	0.027226	0.121056	0.146182
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.150888*	*6.942563*	*0.019412*	*0.071379*	*0.043855*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		0.9	0.7	0.8	0.8	0.5
Sulphate	mg/l		250	575	573	539	657	292
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			41	33	34	37	33
Total Ammonium	mg/l	3		21	16.2	15.9	18.2	2.8
Benzene	mg/l	0.03		0.917	0.504	0.595	0.48	0.001
Toluene	mg/l	1		0.167	0.057	0.048	0.037	0.001
Ethylbenzene	mg/l	0.15		0.222	0.125	0.063	0.035	0.001
Xylene	mg/l	0.07		0.771	0.302	0.171	0.185	0.001
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l			0.78	0.6	0.23	0.5	0.8
2-Isopropyl Phenol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	0.311	0.332	0.522	0.646	0.005
Arsenic by ICP-MS	mg/l	0.06		0.003	0.005	0.003	0.003	0.008
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.002	0.006	0.001	0.004	0.006
Copper by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.005
Nickel by ICP-MS	mg/l	0.075		0.003	0.002	0.005	0.008	0.007
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.001	0.003	0.01	0.002	0.01
Zinc by ICP-MS	mg/l	0.8		0.007	0.02	0.015	0.018	0.018
Benzene by GC	mg/l	0.03			0.768		0.283	0.01
Ethylbenzene by GC	mg/l	1			0.092		0.01	0.01
Toluene by GC	mg/l	0.15			0.089		0.025	0.01
Xylene by GC	mg/l	0.07			0.252		0.146	0.01
MTBE by GC	mg/l				0.01		0.01	0.01
Total TPH	mg/l	0.15		1.6	2.235	0.05	0.146	1.986

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID				BH36	BH36	BH36A	BH36A	BH36A
Depth	*Units*	*Dutch*	*ICRCL / Other*	B8	B9	2.46	B8	B9
Sample date				01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units		<5.5 - >9.5	7.91	7.29	8.1	8.43	7.13
TOC	mg/l			33	31	20	20	20
Suspended solids	mg/l			24	73	1640	10	31
Conductivity (uS/cm)	uS/cm		1500	1330	1329	1246	1472	1344
Cresols	mg/l	0.2		0.01	0.01	0.01	0.01	0.01
Xylenols & Ethylphenols	mg/l			0.09	0.21	0.01	0.01	0.01
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		0.01	0.01	0.01	0.01	0.01
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			0.09	0.21	0.01	0.01	0.01
Naphthalene	mg/l			0.000797	0.001732	0.0012	0.000292	0.000686
Acenaphthene	mg/l			0.010122	0.079758	0.02314	0.009183	0.004201
Fluorene	mg/l			0.001751	0.024343	0.00686	0.001102	0.000677
Phenanthrene	mg/l			0.000416	0.003719	0.001993	0.00005	0.000259
Anthracene	mg/l			0.000419	0.004134	0.000761	0.000116	0.000255
Fluoranthene	mg/l			0.000821	0.003215	0.000646	0.0002	0.001698
Pyrene	mg/l			0.00086	0.004429	0.000443	0.000141	0.001333
Benzo(a)anthracene	mg/l			0.000237	0.000901	0.00012	0.000047	0.000314
Chrysene	mg/l			0.000168	0.000683	0.00009	0.000023	0.000205
Benzo(b)fluoranthene	mg/l			0.000169	0.000323	0.000063	0.00001	0.000061
Benzo(k)fluoranthene	mg/l			0.000133	0.000329	0.000086	0.000015	0.000138
Benzo(e)pyrene	mg/l			0.000078	0.000206	0.000048	0.00001	0.000087
Benzo(a)pyrene	mg/l			0.000141	0.000496	0.000054	0.00001	0.000111
Indeno(1/2/3-cd)pyrene	mg/l			0.000057	0.000137	0.000041	0.00001	0.000043
Di-benz(a/h)anthracene	mg/l			0.000023	0.000097	0.000015	0.00001	0.000031
Benzo(g/h/i)perylene	mg/l			0.000078	0.00021	0.000047	0.00001	0.000058
Total PAH	mg/l			0.016271	0.124804	0.035605	0.011168	0.010159
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.003267*	*0.015556*	*0.005038*	*0.000773*	*0.003767*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		0.5	0.5	0.5	0.5	0.5
Sulphate	mg/l		250	271	261	400	410	380
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			31	29	34	38	31
Total Ammonium	mg/l	3		4.9	6.1	8.5	9.5	10.2
Benzene	mg/l	0.03		0.001	0.001	0.001	0.001	0.001
Toluene	mg/l	1		0.001	0.001	0.001	0.001	0.001
Ethylbenzene	mg/l	0.15		0.001	0.001	0.001	0.001	0.001
Xylene	mg/l	0.07		0.001	0.001	0.001	0.001	0.008
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l			0.25	0.6	0.6	0.4	0.3
2-Isopropyl Phenol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	0.197	0.253	0.21	0.115	0.397
Arsenic by ICP-MS	mg/l	0.06		0.009	0.003	0.017	0.008	0.013
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.001	0.006	0.002	0.001	0.004
Copper by ICP-MS	mg/l	0.075		0.001	0.001	0.004	0.001	0.001
Nickel by ICP-MS	mg/l	0.075		0.008	0.004	0.007	0.005	0.006
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.001	0.001	0.003	0.001	0.001
Zinc by ICP-MS	mg/l	0.8		0.008	0.021	0.019	0.011	0.02
Benzene by GC	mg/l	0.03			0.01			0.01
Ethylbenzene by GC	mg/l	1			0.01			0.01
Toluene by GC	mg/l	0.15			0.01			0.01
Xylene by GC	mg/l	0.07			0.01			0.018
MTBE by GC	mg/l				0.01			0.01
Total TPH	mg/l	0.15		0.05	0.186	0.05	0.05	0.174

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	*Dutch*	*ICRCL / Other*	BH37 B8	BH37 B9	BH37A B8	BH37A B9	BH38 9.73
Sample date				01/09/2003	16/09/03	01/09/2003	16/09/03	20/08/2003
pH	pH units		<5.5 - >9.5	8.27	7.19	8.19	7.39	7.54
TOC	mg/l			34	154	78	65	248
Suspended solids	mg/l			68	15	10	10	8410
Conductivity (uS/cm)	uS/cm		1500	813	1459	1018	1039	
Cresols	mg/l	0.2		0.71	37.66	14.06	11.56	1.92
Xylenols & Ethylphenols	mg/l			0.32	12.33	3.26	11.13	1.43
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		0.54	48.76	20.85	6	1.36
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			1.57	107.52	38.18	32.47	4.83
Naphthalene	mg/l			0.381225	0.074108	0.0042	3.283746	1.304606
Acenaphthene	mg/l			0.014593	0.003682	0.004062	0.017551	0.179215
Fluorene	mg/l			0.052403	0.006268	0.012455	0.058464	0.659971
Phenanthrene	mg/l			0.069609	0.01471	0.018979	0.050757	1.003547
Anthracene	mg/l			0.022771	0.003535	0.008194	0.01472	0.573582
Fluoranthene	mg/l			0.029049	0.009937	0.016018	0.010684	0.780186
Pyrene	mg/l			0.019304	0.00831	0.009685	0.007229	0.606318
Benzo(a)anthracene	mg/l			0.010424	0.004081	0.005388	0.001773	0.514131
Chrysene	mg/l			0.006873	0.003486	0.003905	0.001228	0.358777
Benzo(b)fluoranthene	mg/l			0.007518	0.003482	0.006433	0.000613	0.415653
Benzo(k)fluoranthene	mg/l			0.006959	0.002573	0.003507	0.000642	0.355949
Benzo(e)pyrene	mg/l			0.004008	0.002336	0.002244	0.000551	0.291635
Benzo(a)pyrene	mg/l			0.005997	0.003312	0.003254	0.00087	0.382959
Indeno(1/2/3-cd)pyrene	mg/l			0.003054	0.00155	0.001641	0.00034	0.203381
Di-benz(a/h)anthracene	mg/l			0.001343	0.00058	0.000682	0.000098	0.107265
Benzo(g/h/l)perylene	mg/l			0.003215	0.00195	0.00183	0.000405	0.195363
Total PAH	mg/l			0.038347	0.143901	0.102477	3.44967	7.932538
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.539176*	*0.119242*	*0.066916*	*3.365165*	*5.672481*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		0.5	0.5	0.5	0.5	1.3
Sulphate	mg/l		250	122	198	149	149	463
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			45	207	135	365	299
Total Ammonium	mg/l	3		26.4	85.3	29.7	24.9	48.8
Benzene	mg/l	0.03		1.579	1.674	2.425	4.637	10.853
Toluene	mg/l	1		0.524	0.351	1.574	2.744	5.3
Ethylbenzene	mg/l	0.15		0.035	0.351	0.141	2.744	0.324
Xylene	mg/l	0.07		0.132	0.125	1.414	2.171	3.525
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00007	0.00005	0.00005
Nitrate	mg/l			0.4	0.3	0.22	0.3	0.3
2-Isopropyl Phenol by HPLC	mg/l			0.01	8.78	0.01	3.78	0.12
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	0.054	0.106	0.103	0.198	0.467
Arsenic by ICP-MS	mg/l	0.06		0.01	0.003	0.003	0.012	0.007
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.004	0.004	0.005	0.006	0.007
Copper by ICP-MS	mg/l	0.075		0.001	0.005	0.001	0.001	0.005
Nickel by ICP-MS	mg/l	0.075		0.004	0.001	0.002	0.004	0.006
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.017	0.003	0.007	0.019	0.01
Zinc by ICP-MS	mg/l	0.8		0.028	0.017	0.019	0.014	0.016
Benzene by GC	mg/l	0.03			2.645		5.964	
Ethylbenzene by GC	mg/l	1			0.01		0.128	
Toluene by GC	mg/l	0.15			0.451		2.643	
Xylene by GC	mg/l	0.07			0.126		1.335	
MTBE by GC	mg/l				0.01		0.01	
Total TPH	mg/l	0.15		0.541	4.068	0.169	13.899	2.436

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	*Dutch*	*ICRCL / Other*	BH38 B8	BH38 B9	BH38A 4.62	BH38A B8	BH38A B9
Sample date				01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units		<5.5 - >9.5	8.6	9.59	8.01	7.66	9.12
TOC	mg/l			28	683	568	316	398
Suspended solids	mg/l			10	67	1200	10	21
Conductivity (uS/cm)	uS/cm		1500	4020	4020	3780	2020	2540
Cresols	mg/l	0.2		128.17	200.17	139.27	54.2	98.5
Xylenols & Ethylphenols	mg/l			17.58	107.39	65.87	31.2	78.44
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		13604	139.6	142.09	43.11	54.9
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			290.12	487.89	347.23	129	271.61
Naphthalene	mg/l			0.124298	0.445696	0.462302	0.170803	8.319944
Acenaphthene	mg/l			0.004925	0.004491	0.018603	0.004025	0.030335
Fluorene	mg/l			0.008284	0.007409	0.048648	0.014741	0.099125
Phenanthrene	mg/l			0.016164	0.009612	0.079368	0.028776	0.144792
Anthracene	mg/l			0.004141	0.00337	0.025429	0.010051	0.04879
Fluoranthene	mg/l			0.00617	0.00364	0.043489	0.016737	0.078701
Pyrene	mg/l			0.00451	0.002665	0.02897	0.011013	0.054105
Benzo(a)anthracene	mg/l			0.002203	0.000997	0.016973	0.005936	0.023077
Chrysene	mg/l			0.001531	0.000564	0.010656	0.004189	0.017982
Benzo(b)fluoranthene	mg/l			0.002169	0.00064	0.021634	0.001779	0.013149
Benzo(k)fluoranthene	mg/l			0.001561	0.000411	0.011278	0.004007	0.009443
Benzo(e)pyrene	mg/l			0.001285	0.000354	0.007973	0.002629	0.009865
Benzo(a)pyrene	mg/l			0.00142	0.000513	0.011609	0.003688	0.015033
Indeno(1/2/3-cd)pyrene	mg/l			0.000687	0.000234	0.006571	0.001901	0.00659
Di-benz(a/h)anthracene	mg/l			0.000304	0.000198	0.003054	0.000753	0.001846
Benzo(g/h/i)perylene	mg/l			0.000893	0.000296	0.006477	0.00224	0.007786
Total PAH	mg/l			0.180546	0.48109	0.803033	0.283267	8.880565
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.159068*	*0.465333*	*0.674152*	*0.248328*	*8.672138*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		2.3	2.2	2.2	1.8	2.1
Sulphate	mg/l		250	0.79	997	967	544	716
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			983	52	628	346	662
Total Ammonium	mg/l	3		568.6	514.2	455.2	64.9	152.3
Benzene	mg/l	0.03		6.366	12.05	16.221	8.729	969.958
Toluene	mg/l	1		1.641	5.281	5.412	4.763	1007.852
Ethylbenzene	mg/l	0.15		0.068	0.3	0.268	0.356	175.504
Xylene	mg/l	0.07		0.001	3.393	3.261	0.006	1590.72
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00005	0.00014	0.00005
Nitrate	mg/l			2.75	0.5	0.8	0.18	0.4
2-Isopropyl Phenol by HPLC	mg/l			0.01	40.73	0.01	0.01	39.77
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.09	0.01
Resorcinol by HPLC	mg/l			7.98	0.01	0.01	0.4	0.01
Iron by ICP-MS	mg/l		0.2	1.372	1.47	1.268	0.987	1.304
Arsenic by ICP-MS	mg/l	0.06		0.093	0.069	0.032	0.02	0.026
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.057	0.048	0.042	0.007	0.016
Copper by ICP-MS	mg/l	0.075		0.018	0.019	0.051	0.004	0.004
Nickel by ICP-MS	mg/l	0.075		0.031	0.031	0.022	0.002	0.008
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.004
Selenium by ICP-MS	mg/l		0.01	0.021	0.025	0.035	0.013	0.016
Zinc by ICP-MS	mg/l	0.8		0.014	0.028	0.037	0.01	0.027
Benzene by GC	mg/l	0.03		14.408	18.253	20.5	23.098	18.618
Ethylbenzene by GC	mg/l	1		0.085	0.296	0.393	0.377	1.163
Toluene by GC	mg/l	0.15		2.955	6.474	7.016	8.725	11.612
Xylene by GC	mg/l	0.07		0.831	3.269	2.706	3.501	9.94
MTBE by GC	mg/l			0.01	0.05	1.125	0.027	0.087
Total TPH	mg/l	0.15		0.868	36.551	45.642	0.165	61.075

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	*Dutch*	*ICRCL / Other*	BH39 B8	BH39 B9	BH40 B8	BH40 B9	BH41C B8	BH41C B9
Sample date				01/09/2003	16/09/03	01/09/2003	16/09/03	01/09/2003	16/09/03
pH	pH units		<5.5 - >9.5	7.99	6.9	8.33	11.75	8.14	7.46
TOC	mg/l			48	34	85	56	31	31
Suspended solids	mg/l			30	41	10	88	16	20
Conductivity (uS/cm)	uS/cm		1500	2620	1872	1522	2180	1288	1340
Cresols	mg/l	0.2		35.07	4.63	0.01	0.12	1.08	1.65
Xylenols & Ethylphenols	mg/l			50.2	4.01	0.01	0.01	1.08	3.68
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		13.93	2.38	0.01	0.14	0.44	0.46
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			99.11	12.37	0.01	0.27	2.7	8.9
Naphthalene	mg/l			0.040949	0.576602	0.011512	0.004843	0.486479	3.306788
Acenaphthene	mg/l			0.01406	0.051542	0.001769	0.001921	0.018558	0.015425
Fluorene	mg/l			0.031075	0.098435	0.001528	0.001724	0.023588	0.020234
Phenanthrene	mg/l			0.044719	0.133527	0.001613	0.002757	0.022167	0.013994
Anthracene	mg/l			0.013938	0.039326	0.00029	0.000489	0.005808	0.00289
Fluoranthene	mg/l			0.021579	0.108676	0.000446	0.000976	0.007392	0.001796
Pyrene	mg/l			0.013831	0.075198	0.000257	0.000583	0.004604	0.001058
Benzo(a)anthracene	mg/l			0.006932	0.032024	0.000067	0.000082	0.002545	0.000201
Chrysene	mg/l			0.00496	0.023547	0.000048	0.000059	0.001878	0.0001
Benzo(b)fluoranthene	mg/l			0.006236	0.023928	0.000025	0.000024	0.003886	0.000027
Benzo(k)fluoranthene	mg/l			0.005071	0.019069	0.000025	0.000019	0.001732	0.000033
Benzo(e)pyrene	mg/l			0.003235	0.014213	0.000018	0.000015	0.001231	0.00002
Benzo(a)pyrene	mg/l			0.004431	0.020061	0.000019	0.000017	0.001686	0.000036
Indeno(1/2/3-cd)pyrene	mg/l			0.002499	0.010751	0.00001	0.00001	0.000962	0.000014
Di-benz(a/h)anthracene	mg/l			0.001001	0.003098	0.00001	0.00001	0.000385	0.000012
Benzo(g/h/i)perylene	mg/l			0.002682	0.010857	0.000012	0.00001	0.0011	0.000017
Total PAH	mg/l			0.217198	1.240853	0.01764	0.013508	0.584	3.362644
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.14776*	*0.97444*	*0.014042*	*0.009262*	*0.531749*	*3.325869*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		1.5	0.9	0.5	0.5	3.3	2.5
Sulphate	mg/l		250	1197	98	56	453	468	718
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			36	495	617	26	55	44
Total Ammonium	mg/l	3		29	13	88	79.8	16.2	14.1
Benzene	mg/l	0.03		1.608	0.612	0.002	0.001	1.434	1.329
Toluene	mg/l	1		1.5	0.347	0.002	0.001	1.56	1.651
Ethylbenzene	mg/l	0.15		0.383	0.166	0.002	0.001	0.731	0.787
Xylene	mg/l	0.07		2.534	0.815	3.189	0.001	5.654	6.551
Mercury Low Dutch Target AA	mg/l	0.0003		0.00013	0.00005	0.00005	0.00005	0.00007	0.00005
Nitrate	mg/l			0.4	0.5	8.4	1.9	0.32	0.4
2-Isopropyl Phenol by HPLC	mg/l			0.01	1.35	0.01	0.01	0.01	2.61
Catechol by HPLC	mg/l			0.04	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.06	0.01	0.01	0.01	0.1	0.01
Iron by ICP-MS	mg/l		0.2	0.228	0.277	0.119	0.147	1.36	0.943
Arsenic by ICP-MS	mg/l	0.06		0.01	0.006	0.004	0.003	0.018	0.013
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.003	0.006	0.011	0.009	0.001	0.005
Copper by ICP-MS	mg/l	0.075		0.001	0.002	0.033	0.019	0.001	0.001
Nickel by ICP-MS	mg/l	0.075		0.005	0.004	0.025	0.023	0.003	0.003
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.002	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.001	0.001	0.005	0.003	0.003	0.001
Zinc by ICP-MS	mg/l	0.8		0.006	0.024	0.005	0.016	0.013	0.015
Benzene by GC	mg/l	0.03			1.205		0.01		2.102
Ethylbenzene by GC	mg/l	1			0.189		0.01		0.614
Toluene by GC	mg/l	0.15			0.473		0.01		1.994
Xylene by GC	mg/l	0.07			0.894		0.01		4.976
MTBE by GC	mg/l				0.01		0.01		0.023
Total TPH	mg/l	0.15		0.34	7.27	0.05	1.532	0.379	20.442

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID				BH42	BH42	BH43	BH43	BH7	BH7
Depth	*Units*	*Dutch*	*ICRCL / Other*	B8	B9	B8	B9	B8	B9
Sample date				01/09/2003	16/09/03	01/09/2003	16/09/03	01/09/03	16/09/03
pH	pH units		<5.5 - >9.5	8.98	9.71	8.03	7.36	8.59	9.24
TOC	mg/l			2013	1969	15	16	135	110
Suspended solids	mg/l			42	96	10	194	102	49
Conductivity (uS/cm)	uS/cm		1500	4860	4940	1744	1491	3360	3290
Cresols	mg/l	0.2		3.07	522.84	0.01	2.01	2.66	1.2
Xylenols & Ethylphenols	mg/l			2.47	235.58	0.01	0.79	2.7	2.51
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		2.71	382.18	0.01	1.5	0.68	0.32
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			8.26	1162.59	0.01	4.3	6.04	4.03
Naphthalene	mg/l			0.05504	0.140798	0.000232	0.000614	0.646531	0.493635
Acenaphthene	mg/l			0.002636	0.017996	0.007651	0.018542	0.01809	0.019163
Fluorene	mg/l			0.006034	0.033248	0.000248	0.001029	0.069522	0.057296
Phenanthrene	mg/l			0.00465	0.022117	0.000077	0.000076	0.12256	0.062102
Anthracene	mg/l			0.001625	0.007088	0.00022	0.000275	0.041071	0.017855
Fluoranthene	mg/l			0.001408	0.00252	0.00051	0.000827	0.067632	0.02184
Pyrene	mg/l			0.000883	0.001958	0.00012	0.000374	0.042363	0.015948
Benzo(a)anthracene	mg/l			0.000491	0.00001	0.000061	0.00004	0.024671	0.006658
Chrysene	mg/l			0.000316	0.00001	0.000051	0.000018	0.016983	0.004645
Benzo(b)fluoranthene	mg/l			0.00017	0.00001	0.000014	0.00001	0.018301	0.003958
Benzo(k)fluoranthene	mg/l			0.000272	0.00001	0.000043	0.00001	0.016737	0.003934
Benzo(e)pyrene	mg/l			0.000167	0.00001	0.000033	0.00001	0.00968	0.002557
Benzo(a)pyrene	mg/l			0.000248	0.00001	0.000037	0.00001	0.013966	0.003921
Indeno(1/2/3-cd)pyrene	mg/l			0.000133	0.00001	0.000025	0.00001	0.006841	0.001757
Di-benz(a/h)anthracene	mg/l			0.000051	0.00001	0.00001	0.00001	0.003148	0.000629
Benzo(g/h/i)perylene	mg/l			0.000122	0.00001	0.00003	0.00001	0.00726	0.001989
Total PAH	mg/l			0.074246	0.225725	0.009352	0.021796	1.125355	0.717888
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.064305*	*0.172583*	*0.001286*	*0.00189*	*0.964252*	*0.618336*
Easily-liberatable Cyanide	mg/l			4.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		17.5	11.2	1.2	0.7	21.7	15.5
Sulphate	mg/l		250	1.18	1284	825	770	1444	1563
Sulphide	mg/l			0.09	0.05	0.05	0.05	1.97	1.99
Chloride	mg/l			664	794	33	35	461	640
Total Ammonium	mg/l	3		256	282.8	2.1	2.9	18	20.5
Benzene	mg/l	0.03		8.516	10.546	0.001	0.001	4.829	2.394
Toluene	mg/l	1		4.015	4.75	0.001	0.001	2.875	1.262
Ethylbenzene	mg/l	0.15		0.296	0.289	0.001	0.001	0.319	0.147
Xylene	mg/l	0.07		2.405	2.454	0.375	0.001	2.939	1.538
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l			5.19	0.4	0.3	0.6	0.98	0.3
2-isopropyl Phenol by HPLC	mg/l			0.01	21.99	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	6.112	8.32	0.296	0.434	4.855	5.957
Arsenic by ICP-MS	mg/l	0.06		0.067	0.127	0.002	0.004	0.02	0.03
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.016	0.025	0.001	0.002	0.009	0.007
Copper by ICP-MS	mg/l	0.075		0.008	0.006	0.003	0.003	0.003	0.008
Nickel by ICP-MS	mg/l	0.075		0.081	0.068	0.007	0.004	0.019	0.019
Lead by ICP-MS	mg/l	0.075		0.001	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l		0.01	0.046	0.055	0.001	0.001	0.005	0.006
Zinc by ICP-MS	mg/l	0.8		0.012	0.067	0.014	0.04	0.083	0.121
Benzene by GC	mg/l	0.03		19.407	16.221		0.01	10.647	4.558
Ethylbenzene by GC	mg/l	1		0.259	0.332		0.01	0.262	0.227
Toluene by GC	mg/l	0.15		6.051	5.618		0.01	4.292	1.753
Xylene by GC	mg/l	0.07		2.488	2.809		0.01	2.55	1.606
MTBE by GC	mg/l			0.045	0.02		0.01	0.01	0.1
Total TPH	mg/l	0.15		21.737	36.958		0.027	0.239	10.456

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID / *Depth*	*Units*	*Dutch*	*ICRCL / Other*	TT101 3.5	TT54 3.8	TT55 3.2	TT58 3	TT59 3.4
Sample date				30/07/03	30/07/03	15/08/03	31/07/03	30/07/03
pH	pH units		<5.5 - >9.5	7.82	7.75	7.68	7.98	7.93
TOC	mg/l			23	19	4	23	16
Suspended solids	mg/l			290	512	276	80	22
Conductivity (uS/cm)	uS/cm		1500	1784	1701		1905	1218
Cresols	mg/l	0.2		0.01	0.02	17.89	0.01	0.01
Xylenols & Ethylphenols	mg/l			0.05	0.01	0.01	0.01	0.13
Naphthols	mg/l			0.01	0.01	0.01	0.01	0.01
Phenol	mg/l	2		0.01	0.01	4.79	0.01	0.01
Trimethylphenol	mg/l			0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l			0.07	0.02	22.67	0.01	0.13
Naphthalene	mg/l			0.019001	0.029572	6.440862	0.249089	0.222348
Acenaphthene	mg/l			0.00396	0.025057	0.474681	0.48011	0.023335
Fluorene	mg/l			0.007293	0.004782	0.529709	0.357307	0.028184
Phenanthrene	mg/l			0.013896	0.007191	0.972581	0.548016	0.048069
Anthracene	mg/l			0.004571	0.00189	0.30411	0.046985	0.015022
Fluoranthene	mg/l			0.010069	0.004604	0.450161	0.135588	0.028098
Pyrene	mg/l			0.006625	0.004097	0.306281	0.09739	0.017591
Benzo(a)anthracene	mg/l			0.003204	0.002266	0.14066	0.023485	0.009065
Chrysene	mg/l			0.002574	0.002829	0.112885	0.019869	0.008061
Benzo(b)fluoranthene	mg/l			0.001931	0.00667	0.083258	0.012207	0.014527
Benzo(k)fluoranthene	mg/l			0.001839	0.001726	0.075323	0.006053	0.004294
Benzo(e)pyrene	mg/l			0.001387	0.002315	0.06441	0.007574	0.00363
Benzo(a)pyrene	mg/l			0.002149	0.002661	0.091992	0.011469	0.004717
Indeno(1/2/3-cd)pyrene	mg/l			0.000931	0.002143	0.046595	0.004509	0.002932
Di-benz(a/h)anthracene	mg/l			0.000353	0.000853	0.01758	0.0019	0.001396
Benzo(g/h/l)perylene	mg/l			0.000972	0.002854	0.05498	0.005534	0.003189
Total PAH	mg/l			0.080755	0.10151	10.16607	2.007086	0.434456
Total 10 Dutch PAH	*mg/l*	*0.08175*		*0.059206*	*0.057736*	*8.690149*	*1.050597*	*0.345795*
Easily-liberatable Cyanide	mg/l			0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l	3		0.5	1.3	0.5	1.4	2.1
Sulphate	mg/l		250	728	789	962	1142	559
Sulphide	mg/l			0.05	0.05	0.05	0.05	0.05
Chloride	mg/l			28	35	62	27	37
Total Ammonium	mg/l	3		20.4	6.3	7.5	0.7	2
Benzene	mg/l	0.03		0.313	0.001	5.347	0.011	0.099
Toluene	mg/l	1		0.025	0.001	8.824	0.003	0.012
Ethylbenzene	mg/l	0.15		0.09	0.001	0.884	0.004	0.021
Xylene	mg/l	0.07		0.283	0.009	7.469	0.012	0.095
Mercury Low Dutch Target AA	mg/l	0.0003		0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l			0.7	0.9	0.67	3.7	3.8
2-Isopropyl Phenol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l			0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.2	3.69	0.469	3.72	0.746	4.128
Arsenic by ICP-MS	mg/l	0.06		0.006	0.013	0.011	0.011	0.007
Cadmium by ICP-MS	mg/l	0.006		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.03		0.01	0.002	0.003	0.003	0.007
Copper by ICP-MS	mg/l	0.075		0.002	0.001	0.002	0.002	0.001
Nickel by ICP-MS	mg/l	0.075		0.012	0.005	0.007	0.006	0.014
Lead by ICP-MS	mg/l	0.075		0.009	0.001	0.001	0.047	0.059
Selenium by ICP-MS	mg/l		0.01	0.001	0.002	0.004	0.001	0.001
Zinc by ICP-MS	mg/l	0.8		0.05	0.003	0.003	0.005	0.02
Benzene by GC	mg/l	0.03				5.628		
Ethylbenzene by GC	mg/l	1				0.874		
Toluene by GC	mg/l	0.15				8.984		
Xylene by GC	mg/l	0.07				6.654		
MTBE by GC	mg/l					0.01		
Total TPH	mg/l	0.15		0.123	0.05	72.832	0.496	1.884

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

For inspection purposes only.
Consent of copyright owner required for any other use.

Water Chemical Results

QRA Highlighted Copy

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH31 2.52	BH31 B8	BH31 B9	BH32 1.2	BH32 B8	BH32 B9
Sample date			20/08/2003	01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units		7.83	7.94	7.12	8.23	8.5	7.3
TOC	mg/l		27	692	29	9	12	11
Suspended solids	mg/l		2028	10	17	1088	10	16
Conductivity (uS/cm)	uS/cm		1172	1231	1173	475	477	405
Cresols	mg/l		0.01	0.01	0.01	0.01	0.01	13.01
Xylenols & Ethylphenols	mg/l		0.01	0.01	0.01	0.01	0.01	11.03
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		0.01	0.01	0.01	0.01	0.01	9.35
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		0.01	0.01	0.01	0.01	0.01	33.39
Naphthalene	mg/l		0.000281	0.000463	0.00065	0.343692	0.001147	0.002044
Acenaphthene	mg/l		0.001547	0.000536	0.003704	0.035828	0.017871	0.033303
Fluorene	mg/l		0.000606	0.000147	0.001845	0.052158	0.022153	0.039498
Phenanthrene	mg/l		0.000027	0.00003	0.000041	0.040824	0.006147	0.038047
Anthracene	mg/l		0.000038	0.000017	0.00012	0.013038	0.004192	0.015077
Fluoranthene	mg/l		0.000069	0.000045	0.000155	0.009697	0.004049	0.023354
Pyrene	mg/l		0.000045	0.000035	0.000153	0.005183	0.002066	0.013649
Benzo(a)anthracene	mg/l		0.00001	0.000027	0.000032	0.001951	0.000474	0.005025
Chrysene	mg/l		0.00001	0.000013	0.000013	0.001254	0.000321	0.003813
Benzo(b)fluoranthene	mg/l		0.00001	0.000014	0.00001	0.001748	0.000072	0.002449
Benzo(k)fluoranthene	mg/l		0.00001	0.000011	0.00001	0.001117	0.000253	0.001925
Benzo(e)pyrene	mg/l		0.00001	0.00001	0.00001	0.000709	0.000117	0.00197
Benzo(a)pyrene	mg/l		0.00001	0.00001	0.00001	0.001041	0.000214	0.002729
Indeno(1/2/3-cd)pyrene	mg/l		0.00001	0.00001	0.00001	0.000514	0.000107	0.001285
Di-benz(a/h)anthracene	mg/l		0.00001	0.00001	0.00001	0.000234	0.000044	0.000378
Benzo(g/h/i)perylene	mg/l		0.00001	0.00001	0.00001	0.000524	0.000106	0.001401
Total PAH	mg/l		0.002613	0.001338	0.006713	0.509511	0.059335	0.185946
Total 10 Dutch PAH	*mg/l*		0.000475	0.000636	0.001051	0.413652	0.01701	0.0947
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		0.5	0.9	0.5	0.5	0.5	0.5
Sulphate	mg/l	261	242	252	246	50	53	42
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	51	42	29	25	23	20
Total Ammonium	mg/l	456	1.2	0.9	1.2	0.2	0.8	0.9
Benzene	mg/l	0.0152	0.001	0.001	0.001	0.001	0.001	10.664
Toluene	mg/l		0.001	0.001	0.001	0.001	0.001	6.11
Ethylbenzene	mg/l		0.001	0.001	0.001	0.001	0.001	0.408
Xylene	mg/l	13300	0.001	0.001	0.001	0.005	0.015	3.903
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00006	0.00005	0.00005	0.00007
Nitrate	mg/l		1	0.3	0.3	0.7	0.3	0.4
2-Isopropyl Phenol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.024	0.109	0.072	0.165	0.151	0.413
Arsenic by ICP-MS	mg/l	0.0261	0.004	0.004	0.004	0.011	0.008	0.01
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.002	0.001	0.003	0.002	0.001	0.001
Copper by ICP-MS	mg/l	0.0314	0.005	0.004	0.003	0.002	0.001	0.001
Nickel by ICP-MS	mg/l	0.0523	0.007	0.009	0.004	0.004	0.011	0.001
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	261	0.001	0.002	0.001	0.002	0.001	0.001
Zinc by ICP-MS	mg/l	0.105	0.025	0.046	0.026	0.014	0.063	0.017
Benzene by GC	mg/l	0.0152			0.01			0.01
Ethylbenzene by GC	mg/l				0.01			0.01
Toluene by GC	mg/l				0.01			0 01
Xylene by GC	mg/l	13300			0.01			0.01
MTBE by GC	mg/l				0.01			0.01
Total TPH	mg/l		0.05	0.05	0.014	0.627	0.05	0.415

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH33 1.2	BH33 B8	BH33 B9	BH35 2.97	BH35 B8	BH35 B9
Sample date			20/08/2003	01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units		8.08	8.19	7.02	7.99	8.01	7.21
TOC	mg/l		47	95	100	18	22	21
Suspended solids	mg/l		264	10	14	464	16	76
Conductivity (uS/cm)	uS/cm		1002	1194	1178	1411	1675	1615
Cresols	mg/l		0.06	15 88	0.01	0.01	9.78	0.01
Xylenols & Ethylphenols	mg/l		0.06	10.56	0.1	0.01	20.77	0.11
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		0.04	10.41	0.01	0.01	3.55	0.01
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		0.17	36.86	0.11	0.01	34.11	0.14
Naphthalene	mg/l		0.085537	0.284058	0.27285	0.087859	0.085752	6.749088
Acenaphthene	mg/l		0.012405	0.010854	0.013922	0.012243	0.004055	0.032639
Fluorene	mg/l		0.04783	0.033702	0.022015	0.021714	0.01052	0.11433
Phenanthrene	mg/l		0.03903	0.027364	0.035272	0.020385	0.023212	0.101499
Anthracene	mg/l		0.016014	0.007894	0.010372	0.006763	0.00795	0.029541
Fluoranthene	mg/l		0.017992	0.004335	0.021925	0.010229	0.015128	0.034134
Pyrene	mg/l		0.010992	0.002577	0.014039	0.006314	0.009722	0.022571
Benzo(a)anthracene	mg/l		0.007608	0.000637	0.007102	0.003923	0.005096	0.008232
Chrysene	mg/l		0.004777	0.00038	0.005636	0.002657	0.003629	0.00606
Benzo(b)fluoranthene	mg/l		0.00506	0.000067	0.005404	0.00547	0.005185	0.004054
Benzo(k)fluoranthene	mg/l		0.00484	0.000282	0.004588	0.003179	0.003175	0.003538
Benzo(e)pyrene	mg/l		0.002852	0.00016	0.003518	0.002054	0.002348	0.003368
Benzo(a)pyrene	mg/l		0.004407	0.000206	0.005083	0.002851	0.003232	0.005154
Indeno(1/2/3-cd)pyrene	mg/l		0.002219	0.000124	0.002541	0.001733	0.001793	0.002495
Di-benz(a/h)anthracene	mg/l		0.001146	0.000097	0.000708	0.000785	0.000723	0.000691
Benzo(g/h/l)perylene	mg/l		0.002038	0.000125	0.002915	0.001792	0.001921	0.002822
Total PAH	mg/l		0.264745	0.372863	0.427889	0.189951	0.183441	7.120217
Total 10 Dutch PAH	*mg/l*		0.184462	0.325405	0.368284	0.141371	0.150888	6.942563
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		0.5	0.5	0.5	0.7	0.9	0.7
Sulphate	mg/l	261	190	182	192	580	575	573
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	79	113	118	37	41	33
Total Ammonium	mg/l	456	25.1	47	45.9	18.2	21	16.2
Benzene	mg/l	0.0152	8.244	7.4	7.912	0.017	0.917	0.504
Toluene	mg/l		3.57	3.22	3.145	0.006	0.167	0.057
Ethylbenzene	mg/l		0.255	0.086	0.028	0.036	0.222	0.125
Xylene	mg/l	13300	2.861	2.017	1.917	0.277	0.771	0.302
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l		0.5	0.22	0.3	0.7	0.78	0.6
2-Isopropyl Phenol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.005	0.15	0.555	0.204	0.311	0.332
Arsenic by ICP-MS	mg/l	0.0261	0.009	0.007	0.011	0.005	0.003	0.005
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.005	0.003	0.006	0.002	0.002	0.006
Copper by ICP-MS	mg/l	0.0314	0.004	0.002	0.001	0.005	0.001	0.001
Nickel by ICP-MS	mg/l	0.0523	0.01	0.014	0.014	0.007	0.003	0.002
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	261	0.003	0.001	0.001	0.004	0.001	0.003
Zinc by ICP-MS	mg/l	0.105	0.012	0.037	0.034	0.028	0.007	0.02
Benzene by GC	mg/l	0.0152		17.545	2.04			0.768
Ethylbenzene by GC	mg/l			0.082	0.05			0.092
Toluene by GC	mg/l			5.047	0.636			0.089
Xylene by GC	mg/l	13300		1.879	0.268			0.252
MTBE by GC	mg/l			0.01	0.05			0.01
Total TPH	mg/l		1.329	0.093	3.784	0.666	1.6	2.235

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH35A B8	BH35A B9	BH36 1.84	BH36 B8	BH36 B9	BH36A 2.46
Sample date			01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03	20/08/2003
pH	pH units		8	7.18	8.27	7.91	7.29	8.1
TOC	mg/l		17	20	25	33	31	20
Suspended solids	mg/l		24	33	4752	24	73	1640
Conductivity (uS/cm)	uS/cm		1540	1725	1109	1330	1329	1246
Cresols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Xylenols & Ethylphenols	mg/l		0.04	0.18	0.01	0.09	0.21	0.01
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		0.04	0.29	0.01	0.09	0.21	0.01
Naphthalene	mg/l		0.008813	0.026872	0.003889	0.000797	0.001732	0.0012
Acenaphthene	mg/l		0.002274	0.015105	0.063819	0.010122	0.079758	0.02314
Fluorene	mg/l		0.00384	0.025097	0.030366	0.001751	0.024343	0.00686
Phenanthrene	mg/l		0.005156	0.017269	0.02234	0.000416	0.003719	0.001993
Anthracene	mg/l		0.001519	0.008041	0.007328	0.000419	0.004134	0.000761
Fluoranthene	mg/l		0.002139	0.010521	0.005075	0.000821	0.003215	0.000646
Pyrene	mg/l		0.001254	0.006639	0.006558	0.00086	0.004429	0.000443
Benzo(a)anthracene	mg/l		0.00048	0.002443	0.001458	0.000237	0.000901	0.00012
Chrysene	mg/l		0.000335	0.001808	0.001035	0.000168	0.000683	0.00009
Benzo(b)fluoranthene	mg/l		0.000147	0.001556	0.000831	0.000169	0.000323	0.000063
Benzo(k)fluoranthene	mg/l		0.000332	0.00141	0.000765	0.000133	0.000329	0.000086
Benzo(e)pyrene	mg/l		0.000208	0.001055	0.000586	0.000078	0.000296	0.000048
Benzo(a)pyrene	mg/l		0.000287	0.001483	0.001026	0.000141	0.000496	0.000054
Indeno(1/2/3-cd)pyrene	mg/l		0.000162	0.000686	0.000395	0.000057	0.000137	0.000041
Di-benz(a/h)anthracene	mg/l		0.000091	0.000226	0.000168	0.000023	0.000097	0.000015
Benzo(g/h/l)perylene	mg/l		0.000189	0.000846	0.000544	0.000078	0.00021	0.000047
Total PAH	mg/l		0.027226	0.121056	0.146182	0.016271	0.124804	0.035605
Total 10 Dutch PAH	*mg/l*		0.019412	0.071379	0.043855	0.003267	0.015556	0.005038
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		0.8	0.8	0.5	0.5	0.5	0.5
Sulphate	mg/l	261	539	657	292	271	261	400
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	34	37	33	31	29	34
Total Ammonium	mg/l	456	15.9	18.2	2.8	4.9	6.1	8.5
Benzene	mg/l	0.0152	0.595	0.48	0.001	0.001	0.001	0.001
Toluene	mg/l		0.048	0.037	0.001	0.001	0.001	0.001
Ethylbenzene	mg/l		0.063	0.035	0.001	0.001	0.001	0.001
Xylene	mg/l	13300	0.171	0.185	0.001	0.001	0.001	0.001
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l		0.23	0.5	0.8	0.25	0.6	0.6
2-Isopropyl Phenol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.522	0.646	0.005	0.197	0.253	0.21
Arsenic by ICP-MS	mg/l	0.0261	0.003	0.003	0.008	0.009	0.003	0.017
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.001	0.004	0.006	0.001	0.006	0.002
Copper by ICP-MS	mg/l	0.0314	0.001	0.001	0.005	0.001	0.001	0.004
Nickel by ICP-MS	mg/l	0.0523	0.005	0.008	0.007	0.008	0.004	0.007
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	261	0.01	0.002	0.01	0.001	0.001	0.003
Zinc by ICP-MS	mg/l	0.105	0.015	0.018	0.018	0.008	0.021	0.019
Benzene by GC	mg/l	0.0152		0.283	0.01		0.01	
Ethylbenzene by GC	mg/l			0.01	0.01		0.01	
Toluene by GC	mg/l			0.025	0.01		0.01	
Xylene by GC	mg/l	13300		0.146	0.01		0.01	
MTBE by GC	mg/l			0.01	0.01		0.01	
Total TPH	mg/l		0.05	0.146	1.986	0.05	0.186	0.05

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH36A B8	BH36A B9	BH37 B8	BH37 B9	BH37A B8	BH37A B9
Sample date			01/09/2003	16/09/03	01/09/2003	16/09/03	01/09/2003	16/09/03
pH	pH units		8.43	7.13	8.27	7.19	8.19	7.39
TOC	mg/l		20	20	34	154	78	65
Suspended solids	mg/l		10	31	68	15	10	10
Conductivity (uS/cm)	uS/cm		1472	1344	813	1459	1018	1039
Cresols	mg/l		0.01	0.01	0.71	37.66	14.06	11.56
Xylenols & Ethylphenols	mg/l		0.01	0.01	0.32	12.33	3.26	11.13
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		0.01	0.01	0.54	48.76	20.85	6
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0 01	0.01
Total Phenols	mg/l		0.01	0.01	1.57	107.52	38.18	32.47
Naphthalene	mg/l		0.000292	0.000686	0.381225	0.074108	0.0042	3.283746
Acenaphthene	mg/l		0.009183	0.004201	0.014593	0.003682	0.004062	0.017551
Fluorene	mg/l		0.001102	0.000677	0.052403	0.006268	0.012455	0.058464
Phenanthrene	mg/l		0.00005	0.000259	0.069609	0.01471	0.018979	0.050757
Anthracene	mg/l		0.000116	0.000255	0.022771	0.003535	0.008194	0.01472
Fluoranthene	mg/l		0.0002	0.001698	0.029049	0.009937	0.016018	0.010684
Pyrene	mg/l		0.000141	0.001333	0.019304	0.00831	0.009685	0.007229
Benzo(a)anthracene	mg/l		0.000047	0.000314	0.010424	0.004081	0.005388	0.001773
Chrysene	mg/l		0.000023	0.000205	0.006873	0.003486	0.003905	0.001228
Benzo(b)fluoranthene	mg/l		0.00001	0.000061	0.007518	0.003482	0.006433	0.000613
Benzo(k)fluoranthene	mg/l		0.000015	0.000138	0.006959	0.002573	0.003507	0.000642
Benzo(e)pyrene	mg/l		0.00001	0.000087	0.004008	0.002336	0.002244	0.000551
Benzo(a)pyrene	mg/l		0.00001	0.000111	0.005997	0.003312	0.003254	0.00087
Indeno(1/2/3-cd)pyrene	mg/l		0.00001	0.000043	0.003054	0.00155	0.001641	0.00034
Di-benz(a/h)anthracene	mg/l		0.00001	0.000031	0.001343	0.00058	0.000682	0.000098
Benzo(g/h/i)perylene	mg/l		0.00001	0.000058	0.003215	0.00195	0.00183	0.000405
Total PAH	mg/l		0.011168	0.010159	0.638347	0.143901	0.102477	3.44967
Total 10 Dutch PAH	*mg/l*		0.000723	0.003767	0.539176	0.119242	0.066916	3.365165
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Sulphate	mg/l	261	410	380	122	198	149	149
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	38	31	45	207	135	365
Total Ammonium	mg/l	456	9.5	10.2	26.4	85.3	29.7	24.9
Benzene	mg/l	0.0152	0.001	0.001	1.579	1.674	2.425	4.637
Toluene	mg/l		0.001	0.001	0.524	0.351	1.574	2.744
Ethylbenzene	mg/l		0.001	0.001	0.035	0.351	0.141	2.744
Xylene	mg/l	13300	0.001	0.008	0.132	0.125	1.414	2.171
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00005	0.00005	0.00007	0.00005
Nitrate	mg/l		0.4	0.3	0.4	0.3	0.22	0.3
2-Isopropyl Phenol by HPLC	mg/l		0.01	0.01	0.01	8.78	0.01	3.78
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		0.115	0.397	0.054	0.106	0.103	0.198
Arsenic by ICP-MS	mg/l	0.0261	0.008	0.013	0.01	0.003	0.003	0.012
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.001	0.004	0.004	0.004	0.005	0.006
Copper by ICP-MS	mg/l	0.0314	0.001	0.001	0.001	0.005	0.001	0.001
Nickel by ICP-MS	mg/l	0.0523	0.005	0.006	0.004	0.001	0.002	0.004
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	261	0.001	0.001	0.017	0.003	0.007	0.019
Zinc by ICP-MS	mg/l	0.105	0.011	0.02	0.028	0.017	0.019	0.014
Benzene by GC	mg/l	0.0152		0.01		2.645		5.964
Ethylbenzene by GC	mg/l			0.01		0.01		0.128
Toluene by GC	mg/l			0.01		0.451		2.643
Xylene by GC	mg/l	13300		0.018		0.126		1.335
MTBE by GC	mg/l			0.01		0.01		0.01
Total TPH	mg/l		0.05	0.174	0.541	4.068	0.169	13.899

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH38 9.73	BH38 B8	BH38 B9	BH38A 4.62	BH38A B8	BH38A B9
Sample date			20/08/2003	01/09/2003	16/09/03	20/08/2003	01/09/2003	16/09/03
pH	pH units		7.54	8.6	9.59	8.01	7.66	9.12
TOC	mg/l		248	28	683	568	316	398
Suspended solids	mg/l		8410	10	67	1200	10	21
Conductivity (uS/cm)	uS/cm			4020	4020	3780	2020	2540
Cresols	mg/l		1.92	128.17	200.17	139.27	54.2	98.5
Xylenols & Ethylphenols	mg/l		1.43	17.58	107.39	65.87	31.2	78.44
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		1.36	13604	139.6	142.09	43.11	54.9
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		4.83	290.12	487.89	347.23	129	271.61
Naphthalene	mg/l		1.304606	0.124298	0.445696	0.462302	0.170803	8.319944
Acenaphthene	mg/l		0.179215	0.004925	0.004491	0.018603	0.004025	0.030335
Fluorene	mg/l		0.659971	0.008284	0.007409	0.048648	0.014741	0.099125
Phenanthrene	mg/l		1.003547	0.016164	0.009612	0.079368	0.028776	0.144792
Anthracene	mg/l		0.573582	0.004141	0.00337	0.025429	0.010051	0.04879
Fluoranthene	mg/l		0.780186	0.00617	0.00364	0.043489	0.016737	0.078701
Pyrene	mg/l		0.606318	0.00451	0.002665	0.02897	0.011013	0.054105
Benzo(a)anthracene	mg/l		0.514131	0.002203	0.000997	0.016973	0.005936	0.023077
Chrysene	mg/l		0.358777	0.001531	0.000564	0.010656	0.004189	0.017982
Benzo(b)fluoranthene	mg/l		0.415653	0.002169	0.00064	0.021634	0.001779	0.013149
Benzo(k)fluoranthene	mg/l		0.355949	0.001561	0.000411	0.011278	0.004007	0.009443
Benzo(e)pyrene	mg/l		0.291635	0.001285	0.000354	0.007973	0.002629	0.009865
Benzo(a)pyrene	mg/l		0.382959	0.00142	0.000513	0.011609	0.003688	0.015033
Indeno(1/2/3-cd)pyrene	mg/l		0.203381	0.000687	0.000234	0.006571	0.001901	0.00659
Di-benz(a/h)anthracene	mg/l		0.107265	0.000304	0.000198	0.003054	0.000753	0.001846
Benzo(g/h/l)perylene	mg/l		0.195363	0.000893	0.000296	0.006477	0.00224	0.007786
Total PAH	mg/l		7.932538	0.180546	0.48109	0.803033	0.283267	8.880565
Total 10 Dutch PAH	*mg/l*		5.672481	0.159068	0.465333	0.674152	0.248328	8.672138
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		1.3	2.3	2.2	2.2	1.8	2.1
Sulphate	mg/l	261	463	0.79	997	967	544	716
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	299	983	52	628	346	662
Total Ammonium	mg/l	456	48.8	568.6	514.2	455.2	64.9	152.3
Benzene	mg/l	0.0152	10.853	6.366	12.05	16.221	8.729	969.958
Toluene	mg/l		5.3	1.641	5.281	5.412	4.763	1007.852
Ethylbenzene	mg/l		0.324	0.068	0.3	0.268	0.356	175.504
Xylene	mg/l	13300	3.525	0.001	3.393	3.261	0.006	1590.72
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00005	0.00005	0.00014	0.00005
Nitrate	mg/l		0.3	2.75	0.5	0.8	0.18	0.4
2-Isopropyl Phenol by HPLC	mg/l		0.12	0.01	40.73	0.01	0.01	39.77
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.09	0.01
Resorcinol by HPLC	mg/l		0.01	7.98	0.01	0.01	0.4	0.01
Iron by ICP-MS	mg/l		0.467	1.372	1.47	1.268	0.987	1.304
Arsenic by ICP-MS	mg/l	0.0261	0.007	0.093	0.069	0.032	0.02	0.026
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.007	0.057	0.048	0.042	0.007	0.016
Copper by ICP-MS	mg/l	0.0314	0.005	0.018	0.019	0.051	0.004	0.004
Nickel by ICP-MS	mg/l	0.0523	0.006	0.031	0.031	0.022	0.002	0.008
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.001	0.001	0.004
Selenium by ICP-MS	mg/l	261	0.01	0.021	0.025	0.035	0.013	0.016
Zinc by ICP-MS	mg/l	0.105	0.016	0.014	0.028	0.037	0.01	0.027
Benzene by GC	mg/l	0.0152		14.408	18.253	20.5	23.098	18.618
Ethylbenzene by GC	mg/l			0.085	0.296	0.393	0.377	1.163
Toluene by GC	mg/l			2.955	6.474	7.016	8.725	11.612
Xylene by GC	mg/l	13300		0.831	3.269	2.706	3.501	9.94
MTBE by GC	mg/l			0.01	0.05	1.125	0.027	0.087
Total TPH	mg/l		2.436	0.868	36.551	45.642	0.165	61.075

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH39 B8	BH39 B9	BH40 B8	BH40 B9	BH41C B8	BH41C B9
Sample date			01/09/2003	16/09/03	01/09/2003	16/09/03	01/09/2003	16/09/03
pH	pH units		7.99	6.9	8.33	11.75	8.14	7.46
TOC	mg/l		48	34	85	56	31	31
Suspended solids	mg/l		30	41	10	88	16	20
Conductivity (uS/cm)	uS/cm		2620	1872	1522	2180	1288	1340
Cresols	mg/l		35.07	4.63	0.01	0.12	1.08	1.65
Xylenols & Ethylphenols	mg/l		50.2	4.01	0.01	0.01	1.08	3.68
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		13.93	2.38	0.01	0.14	0.44	0.46
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		99.11	12.37	0.01	0.27	2.7	8.9
Naphthalene	mg/l		0.040949	0.576602	0.011512	0.004843	0.486479	3.306788
Acenaphthene	mg/l		0.01406	0.051542	0.001769	0.001921	0.018558	0.015425
Fluorene	mg/l		0.031075	0.098435	0.001528	0.001724	0.023588	0.020234
Phenanthrene	mg/l		0.044719	0.133527	0.001613	0.002757	0.022167	0.013994
Anthracene	mg/l		0.013938	0.039326	0.00029	0.000489	0.005808	0.00289
Fluoranthene	mg/l		0.021579	0.108676	0.000446	0.000976	0.007392	0.001796
Pyrene	mg/l		0.013831	0.075198	0.000257	0.000583	0.004604	0.001058
Benzo(a)anthracene	mg/l		0.006932	0.032024	0.000067	0.000082	0.002545	0.000201
Chrysene	mg/l		0.00496	0.023547	0.000048	0.000059	0.001878	0.0001
Benzo(b)fluoranthene	mg/l		0.006236	0.023928	0.000025	0.000024	0.003886	0.000027
Benzo(k)fluoranthene	mg/l		0.005071	0.019069	0.000025	0.000019	0.001732	0.000033
Benzo(e)pyrene	mg/l		0.003235	0.014213	0.000018	0.000015	0.001231	0.00002
Benzo(a)pyrene	mg/l		0.004431	0.020061	0.000019	0.000017	0.001686	0.000036
Indeno(1/2/3-cd)pyrene	mg/l		0.002499	0.010751	0.00001	0.00001	0.000962	0.000014
Di-benz(a/h)anthracene	mg/l		0.001001	0.003098	0.00001	0.00001	0.000385	0.000012
Benzo(g/h/i)perylene	mg/l		0.002682	0.010857	0.000012	0.00001	0.0011	0.000017
Total PAH	mg/l		0.217198	1.240853	0.01764	0.013508	0.584	3.362644
Total 10 Dutch PAH	*mg/l*		0.14776	0.97444	0.014042	0.009262	0.531749	3.325869
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		1.5	0.9	0.5	0.5	3.3	2.5
Sulphate	mg/l	261	1197	98	56	453	468	718
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	36	495	617	26	55	44
Total Ammonium	mg/l	456	29	13	88	79.8	16.2	14.1
Benzene	mg/l	0.0152	1.608	0.612	0.002	0.001	1.434	1.329
Toluene	mg/l		1.5	0.347	0.002	0.001	1.56	1.651
Ethylbenzene	mg/l		0.383	0.166	0.002	0.001	0.731	0.787
Xylene	mg/l	13300	2.534	0.815	3.189	0.001	5.654	6.551
Mercury Low Dutch Target AA	mg/l	0.00105	0.00013	0.00005	0.00005	0.00005	0.00007	0.00005
Nitrate	mg/l		0.4	0.5	8.4	1.9	0.32	0.4
2-Isopropyl Phenol by HPLC	mg/l		0.01	1.35	0.01	0.01	0.01	2.61
Catechol by HPLC	mg/l		0.04	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.06	0.01	0.01	0.01	0.1	0.01
Iron by ICP-MS	mg/l		0.228	0.277	0.119	0.147	1.36	0.943
Arsenic by ICP-MS	mg/l	0.0261	0.01	0.006	0.004	0.003	0.018	0.013
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.003	0.006	0.011	0.009	0.001	0.005
Copper by ICP-MS	mg/l	0.0314	0.001	0.002	0.033	0.019	0.001	0.001
Nickel by ICP-MS	mg/l	0.0523	0.005	0.004	0.025	0.023	0.003	0.003
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.002	0.001	0.001
Selenium by ICP-MS	mg/l	261	0.001	0.001	0.005	0.003	0.003	0.001
Zinc by ICP-MS	mg/l	0.105	0.006	0.024	0.005	0.016	0.013	0.015
Benzene by GC	mg/l	0.0152		1.205		0.01		2.102
Ethylbenzene by GC	mg/l			0.189		0.01		0.614
Toluene by GC	mg/l			0.473		0.01		1.994
Xylene by GC	mg/l	13300		0.894		0.01		4.976
MTBE by GC	mg/l			0.01		0.01		0.023
Total TPH	mg/l		0.34	7.27	0.05	1.532	0.379	20.442

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	BH42 B8	BH42 B9	BH43 B8	BH43 B9	BH7 B8	BH7 B9
Sample date			01/09/2003	16/09/03	01/09/2003	16/09/03	01/09/03	16/09/03
pH	pH units		8.98	9.71	8.03	7.36	8.59	9.24
TOC	mg/l		2013	1969	15	16	135	110
Suspended solids	mg/l		42	96	10	194	102	49
Conductivity (uS/cm)	uS/cm		4860	4940	1744	1491	3360	3290
Cresols	mg/l		3.07	522.84	0.01	2.01	2.66	1.2
Xylenols & Ethylphenols	mg/l		2.47	235.58	0.01	0.79	2.7	2.51
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		2.71	382.18	0.01	1.5	0.68	0.32
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		8.26	1162.59	0.01	4.3	6.04	4.03
Naphthalene	mg/l		0.05504	0.140798	0.000232	0.000614	0.646531	0.493635
Acenaphthene	mg/l		0.002636	0.017996	0.007651	0.018542	0.01809	0.019163
Fluorene	mg/l		0.006034	0.033248	0.000248	0.001029	0.069522	0.057296
Phenanthrene	mg/l		0.00465	0.022117	0.000077	0.000076	0.12256	0.062102
Anthracene	mg/l		0.001625	0.007088	0.00022	0.000275	0.041071	0.017855
Fluoranthene	mg/l		0.001408	0.00252	0.00051	0.000827	0.067632	0.02184
Pyrene	mg/l		0.000883	0.001958	0.00012	0.000374	0.042363	0.015948
Benzo(a)anthracene	mg/l		0.000491	0.00001	0.000061	0.00004	0.024671	0.006658
Chrysene	mg/l		0.000316	0.00001	0.000051	0.000018	0.016983	0.004645
Benzo(b)fluoranthene	mg/l		0.00017	0.00001	0.000014	0.00001	0.018301	0.003958
Benzo(k)fluoranthene	mg/l		0.000272	0.00001	0.000043	0.00001	0.016737	0.003934
Benzo(e)pyrene	mg/l		0.000167	0.00001	0.000033	0.00001	0.00968	0.002557
Benzo(a)pyrene	mg/l		0.000248	0.00001	0.000037	0.00001	0.013966	0.003921
Indeno(1/2/3-cd)pyrene	mg/l		0.000133	0.00001	0.000025	0.00001	0.006841	0.001757
Di-benz(a/h)anthracene	mg/l		0.000051	0.00001	0.00001	0.00001	0.003148	0.000629
Benzo(g/h/l)perylene	mg/l		0.000122	0.00001	0.00003	0.00001	0.00726	0.001989
Total PAH	mg/l		0.074246	0.225725	0.009352	0.021796	1.125355	0.717888
Total 10 Dutch PAH	*mg/l*		0.043305	0.172583	0.001286	0.00189	0.964252	0.618336
Easily-liberatable Cyanide	mg/l		4.5	0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		17.5	11.2	1.2	0.7	21.7	15.5
Sulphate	mg/l	261	1.18	1284	825	770	1444	1563
Sulphide	mg/l	0.000261	0.09	0.05	0.05	0.05	1.97	1.99
Chloride	mg/l	261	664	794	33	35	461	640
Total Ammonium	mg/l	456	256	282.8	2.1	2.9	18	20.5
Benzene	mg/l	0.0152	8.516	10.546	0.001	0.001	4.829	2.394
Toluene	mg/l		4.015	4.75	0.001	0.001	2.875	1.262
Ethylbenzene	mg/l		0.296	0.289	0.001	0.001	0.319	0.147
Xylene	mg/l	13300	2.405	2.454	0.375	0.001	2.939	1.538
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l		5.19	0.4	0.3	0.6	0.98	0.3
2-Isopropyl Phenol by HPLC	mg/l		0.01	21.99	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		6.112	8.32	0.296	0.434	4.855	5.957
Arsenic by ICP-MS	mg/l	0.0261	0.067	0.127	0.002	0.004	0.02	0.03
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.016	0.025	0.001	0.002	0.009	0.007
Copper by ICP-MS	mg/l	0.0314	0.008	0.006	0.003	0.003	0.003	0.008
Nickel by ICP-MS	mg/l	0.0523	0.081	0.068	0.007	0.004	0.019	0.019
Lead by ICP-MS	mg/l		0.001	0.001	0.001	0.001	0.001	0.001
Selenium by ICP-MS	mg/l	261	0.046	0.055	0.001	0.001	0.005	0.006
Zinc by ICP-MS	mg/l	0.105	0.012	0.067	0.014	0.04	0.083	0.121
Benzene by GC	mg/l	0.0152	19.407	16.221		0.01	10.647	4.558
Ethylbenzene by GC	mg/l		0.259	0.332		0.01	0.262	0.227
Toluene by GC	mg/l		6.051	5.618		0.01	4.292	1.753
Xylene by GC	mg/l	13300	2.488	2.809		0.01	2.55	1.606
MTBE by GC	mg/l		0.045	0.02		0.01	0.01	0.1
Total TPH	mg/l		21.737	36.958		0.027	0.239	10.456

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:03

Client Sample ID *Depth*	*Units*	*QRA*	TT101 3.5	TT54 3.8	TT55 3.2	TT58 3	TT59 3.4
Sample date			30/07/03	30/07/03	15/08/03	31/07/03	30/07/03
pH	pH units		7.82	7.75	7.68	7.98	7.93
TOC	mg/l		23	19	4	23	16
Suspended solids	mg/l		290	512	276	80	22
Conductivity (uS/cm)	uS/cm		1784	1701		1905	1218
Cresols	mg/l		0.01	0.02	17.89	0.01	0.01
Xylenols & Ethylphenols	mg/l		0.05	0.01	0.01	0.01	0.13
Naphthols	mg/l		0.01	0.01	0.01	0.01	0.01
Phenol	mg/l		0.01	0.01	4.79	0.01	0.01
Trimethylphenol	mg/l		0.01	0.01	0.01	0.01	0.01
Total Phenols	mg/l		0.07	0.02	22.67	0.01	0.13
Naphthalene	mg/l		0.019001	0.029572	6.440862	0.249089	0.222348
Acenaphthene	mg/l		0.00396	0.025057	0.474681	0.48011	0.023335
Fluorene	mg/l		0.007293	0.004782	0.529709	0.357307	0.028184
Phenanthrene	mg/l		0.013896	0.007191	0.972581	0.548016	0.048069
Anthracene	mg/l		0.004571	0.00189	0.30411	0.046985	0.015022
Fluoranthene	mg/l		0.010069	0.004604	0.450161	0.135588	0.028098
Pyrene	mg/l		0.006625	0.004097	0.306281	0.09739	0.017591
Benzo(a)anthracene	mg/l		0.003204	0.002266	0.14066	0.023485	0.009065
Chrysene	mg/l		0.002574	0.002829	0.112885	0.019869	0.008061
Benzo(b)fluoranthene	mg/l		0.001931	0.00667	0.083258	0.012207	0.014527
Benzo(k)fluoranthene	mg/l		0.001839	0.001726	0.075323	0.006053	0.004294
Benzo(e)pyrene	mg/l		0.001387	0.002315	0.06441	0.007574	0.00363
Benzo(a)pyrene	mg/l		0.002149	0.002661	0.091992	0.011469	0.004717
Indeno(1/2/3-cd)pyrene	mg/l		0.000931	0.002143	0.046595	0.004509	0.002932
Di-benz(a/h)anthracene	mg/l		0.000353	0.000853	0.01758	0.0019	0.001396
Benzo(g/h/i)perylene	mg/l		0.000972	0.002854	0.05498	0.005534	0.003189
Total PAH	mg/l		0.080755	0.10151	10.16607	2.007086	0.434456
Total 10 Dutch PAH	*mg/l*		0.059206	0.057736	8.690149	1.050597	0.345795
Easily-liberatable Cyanide	mg/l		0.5	0.5	0.5	0.5	0.5
Total Cyanide	mg/l		0.5	1.3	0.5	1.4	2.1
Sulphate	mg/l	261	728	789	962	1142	559
Sulphide	mg/l	0.000261	0.05	0.05	0.05	0.05	0.05
Chloride	mg/l	261	28	35	62	27	37
Total Ammonium	mg/l	456	20.4	6.3	7.5	0.7	2
Benzene	mg/l	0.0152	0.313	0.001	5.347	0.011	0.099
Toluene	mg/l		0.025	0.001	8.824	0.003	0.012
Ethylbenzene	mg/l		0.09	0.001	0.884	0.004	0.021
Xylene	mg/l	13300	0.283	0.009	7.469	0.012	0.095
Mercury Low Dutch Target AA	mg/l	0.00105	0.00005	0.00005	0.00005	0.00005	0.00005
Nitrate	mg/l		0.7	0.9	0.67	3.7	3.8
2-Isopropyl Phenol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01
Catechol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01
Resorcinol by HPLC	mg/l		0.01	0.01	0.01	0.01	0.01
Iron by ICP-MS	mg/l		3.69	0.469	3.72	0.746	4.128
Arsenic by ICP-MS	mg/l	0.0261	0.006	0.013	0.011	0.011	0.007
Cadmium by ICP-MS	mg/l		0.0004	0.0004	0.0004	0.0004	0.0004
Chromium by ICP-MS	mg/l	0.00314	0.01	0.002	0.003	0.003	0.007
Copper by ICP-MS	mg/l	0.0314	0.002	0.001	0.002	0.002	0.001
Nickel by ICP-MS	mg/l	0.0523	0.012	0.005	0.007	0.006	0.014
Lead by ICP-MS	mg/l		0.009	0.001	0.001	0.047	0.059
Selenium by ICP-MS	mg/l	261	0.001	0.002	0.004	0.001	0.001
Zinc by ICP-MS	mg/l	0.105	0.05	0.003	0.003	0.005	0.02
Benzene by GC	mg/l	0.0152			5.628		
Ethylbenzene by GC	mg/l				0.874		
Toluene by GC	mg/l				8.984		
Xylene by GC	mg/l	13300			6.654		
MTBE by GC	mg/l				0.01		
Total TPH	mg/l		0.123	0.05	72.832	0.496	1.884

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04

For inspection purposes only.
Consent of copyright owner required for any other use.

Water Chemical Results

TPH Results

EPA Export 29-05-2012:04:39:04

TPH RAP Water

Sample Number	272	353	281	362	290	371	299	380	389	398	317	407
Sample Identity	BH31	BH31	BH32	BH32	BH33	BH33	BH35	BH35	BH35A	BH36	BH36A	BH36A
Depth	2.52		1.2		6.8		2.97				2.46	
Total Hydrocarbon	716	566	5067	767	22345	45936	7085	16350	1370	1489	2561	2703
Aliphatic												
>C8-C10	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C10-C16	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C21	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C21-C40	<50	<50	<50	<50	<50	<50	55	68	<50	<50	<50	<50
Mineral oil content	<50	<50	<50	<50	<50	<50	55	105	<50	<50	<50	<50
Aromatic												
C8-C10	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C10-C16	<50	<50	351	<50	159	<50	281	91	<50	<50	<50	<50
>C16-C21	<50	<50	207	<50	851	72	244	652	<50	<50	<50	<50
>C21-C40	<50	<50	69	<50	319	<50	86	752	<50	<50	<50	<50
Aromatic content	<50	<50	627	<50	1329	93	611	1495	<50	<50	<50	<50
Total TPH(C8-C40)	<50	<50	627	<50	1329	93	666	1600	<50	<50	<50	<50

All units in ug/l

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04

Sample Number	416	425	326	434	443	452	461	471	479	488	344	226
Sample Identity	BH37	BH37A	BH38	BH38	BH38A	BH39	BH40	BH41	BH41C	BH42	BH7	TT101
Depth			9.73									3.5
Total Hydrocarbon	18921	8137	205681	103698	40432	9974	392	541	14142	307320	14703	1444
Aliphatic												
>C8-C10	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C10-C16	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16-C21	<50	<50	51	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C21-C40	<50	<50	116	<50	<50	<50	<50	<50	<50	<50	<50	<50
Mineral oil content	<50	<50	167	<50	<50	62	<50	<50	<50	<50	<50	<50
Aromatic												
C8-C10	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C10-C16	101	<50	340	711	57	<50	<50	<50	157	20910	<50	<50
>C16-C21	300	74	885	131	65	152	<50	<50	192	704	115	<50
>C21-C40	140	87	1044	<50	<50	97	<50	<50	<50	119	115	78
Aromatic content	541	169	2269	868	165	278	<50	<50	379	21737	239	123
Total TPH(C8-C40)	541	169	2436	868	165	340	<50	<50	379	21737	239	123

All units in ug/l

Consent of copyright owner required for any other use.
For inspection purposes only.

EPA Export 29-05-2012:04:39:04

Sample Number	149	61	71
Sample Identity	TT54	TT58	TT59
Depth	3.8	3.0	3.4
Total Hydrocarbon	2397	17488	11899
Aliphatic			
>C8-C10	<50	<50	<50
>C10-C16	<50	<50	<50
>C16-C21	<50	107	69
>C21-C40	<50	89	321
Mineral oil content	<50	201	390
Aromatic			
C8-C10	<50	<50	<50
>C10-C16	<50	<50	<50
>C16-C21	<50	180	383
>C21-C40	<50	92	1070
Aromatic content	<50	295	1494
Total TPH(C8-C40)	<50	496	1884

All units in ug/l

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04

TPH CWG Water

Sample Number	509+516	517+525	527+535	536+544	545+553	308+316	554+562	563+571	572+580	581+588	589+597	335+343
Client Ref:	BH31	BH32	BH33	BH35	BH35A	BH36	BH36	BH36A	BH37	BH37A	BH38	BH38A
Depth	B9	B9	B9	B9	B9	1.8	B9	B9	B9	B9	B9	4.6
Aliphatics												
C5-C6	<10	<10	<10	<10	<10	<10	<10	<10	10	<10	10	<10
>C6-C8	<10	<10	46	15	16	<10	<10	14	16	211	27	135
>C8-C10	<10	<10	23	44	25	<10	<10	22	49	214	240	558
>C10-C12	<10	<10	248	204	56	<10	<10	35	241	1266	3033	4144
>C12-C16	<10	67	<10	21	<10	671	42	<10	<10	<10	<10	198
>C16-C21	<10	35	<10	10	<10	634	42	<10	<10	<10	<10	29
>C21-C35	<10	16	<10	<10	<10	219	<10	<10	<10	<10	<10	10
Total Aliphatics	<10	118	317	295	98	1524	84	71	316	1691	3310	5074
Aromatics												
C6-C7	<10	<10	2040	768	283	<10	<10	<10	2645	5964	18253	20500
>C7-C8	<10	<10	636	89	25	<10	<10	<10	451	2463	6474	7016
>C8-C10	<10	<10	303	411	184	<10	<10	50	200	1784	3925	5061
>C10-C12	<10	<10	371	307	85	<10	<10	53	361	1898	4549	6215
>C12-C16	14	220	102	233	72	40	102	<10	65	99	32	1322
>C16-C21	<10	58	15	102	22	51	<10	<10	20	<10	<10	324
>C21-C35	<10	19	<10	31	<10	10	<10	<10	10	<10	<10	130
Total Aromatics	14	297	3467	1940	670	462	102	103	3752	12208	33241	40568
PRO	<10	<10	3667	1838	674	<10	<10	174	3973	13800	36511	43629
TPH	14	415	3784	2235	768	1986	186	174	4068	13899	36551	45642
MTBE	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene	<10	<10	2040	768	283	<10	<10	<10	2645	5964	18253	20500
Toluene	<10	<10	636	89	25	<10	<10	<10	451	2463	6474	7016
Ethylbenzene	<10	<10	<10	92	<10	<10	<10	<10	<10	128	296	393
Xylene	<10	<10	268	252	146	<10	<10	18	126	1335	3269	3831

*TPH is the sum of Aliphatics and Aromatics (C5-C35)
All units in ug/l

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04

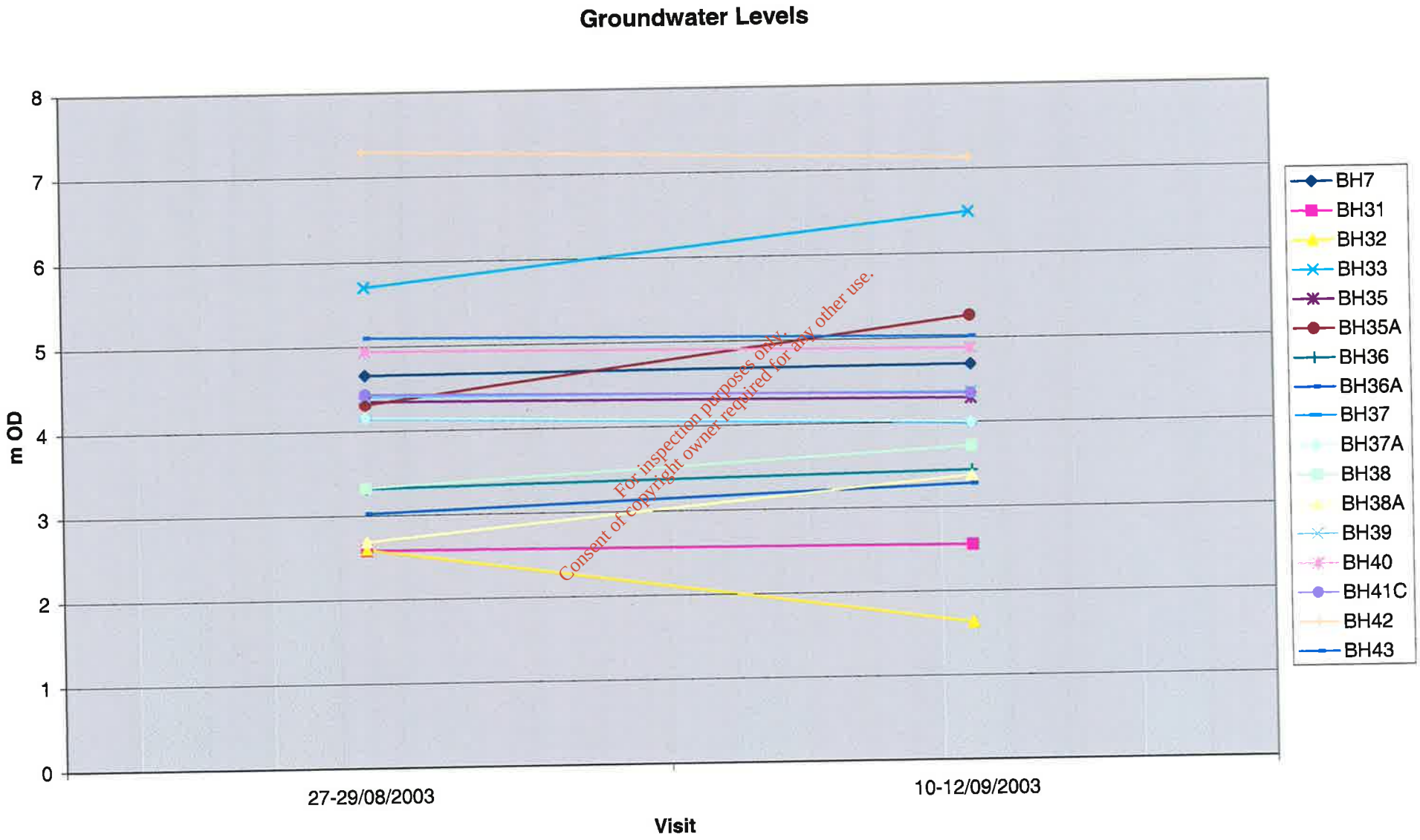
Sample Number	598+607	608+616	617+625	626+634	635+643	644+649	497+508	053+058
Client Ref:	BH38A	BH39	BH40	BH41C	BH42	BH43	BH7	TT55
Depth	B9	B9	B9	B9	B9	B9	B9	3.2
Aliphatics								
C5-C6	92	<10	<10	12	49	<10	10	<10
>C6-C8	395	113	<10	354	226	<10	13	15
>C8-C10	1192	164	<10	568	511	<10	60	726
>C10-C12	5991	614	<10	3568	2676	<10	740	4502
>C12-C16	84	751	<10	<10	561	<10	10	15501
>C16-C21	55	1216	<10	<10	77	<10	<10	4629
>C21-C35	30	470	<10	<10	10	<10	<10	1006
Total Aliphatics	7840	3329	16	4502	4109	<10	833	26379
Aromatics								
C6-C7	18618	1205	<10	2102	16221	<10	4558	5628
>C7-C8	11612	473	<10	1994	5618	<10	1753	8984
>C8-C10	12892	1330	<10	6441	3907	<10	1924	8617
>C10-C12	8987	922	<10	5353	4013	<10	1110	6754
>C12-C16	902	12	1022	50	2548	27	205	11566
>C16-C21	185	<10	412	<10	480	<10	55	3587
>C21-C35	40	<10	82	<10	61	<10	18	1317
Total Aromatics	53235	3941	1516	15940	32849	27	9623	46453
PRO	59866	4821	<10	20415	33221	<10	10168	35226
TPH	61075	7270	1532	20442	36958	27	10456	72832
MTBE	87	<10	<10	23	<10	<10	<10	<10
Benzene	18618	1205	<10	2102	16221	<10	4558	5628
Toluene	11612	473	<10	1994	5618	<10	1753	8984
Ethylbenzene	1163	189	<10	614	332	<10	227	874
Xylene	9940	394	<10	4976	2809	<10	1606	6654

*TPH is the sum of

All units in ug/l

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04



For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04

Borehole No.	Level (mOD)	13-15/08/2003		27-29/08/2003		10-12/09/2003	
		Depth (mbgl)	**Depth (mOD)**	Depth (mbgl)	**Depth (mOD)**	Depth (mbgl)	**Depth (mOD)**
BH7	5.81			1.15	**4.66**	1.121	**4.69**
BH31	5.2	2.52	**2.68**	2.608	**2.59**	2.645	**2.56**
BH32	3.87	1.2	**2.67**	1.266	**2.60**	2.235	**1.64**
BH33	7.34	6.8	**0.54**	1.634	**5.71**	0.845	**6.50**
BH35	7.49	2.97	**4.52**	3.14	**4.35**	3.205	**4.29**
BH35A	7.47			3.159	**4.31**	2.205	**5.27**
BH36	5.3	1.84	**3.46**	1.979	**3.32**	1.865	**3.44**
BH36A	5.31	2.46	**2.85**	2.284	**3.03**	2.035	**3.28**
BH37	6.35			2.2	**4.15**	2.36	**3.99**
BH37A	6.35			2.197	**4.15**	2.351	**4.00**
BH38	5.84	4.62	**1.22**	2.513	**3.33**	2.12	**3.72**
BH38A	5.79	9.73	**-3.94**	3.099	**2.69**	2.416	**3.37**
BH39	6.39			1.984	**4.41**	2.033	**4.36**
BH40	7.63			2.685	**4.95**	2.752	**4.88**
BH41C	7.23			2.797	**4.43**	2.89	**4.34**
BH42	8.08			0.779	**7.30**	0.95	**7.13**
BH43	8.54			3.436	**5.10**	3.522	**5.02**

	27-29/08/2003	10-12/09/2003	AVERAGE
BH7	4.66	4.689	4.67
BH31	2.592	2.555	2.57
BH32	2.604	1.635	2.12
BH33	5.706	6.495	6.10
BH35	4.35	4.285	4.32
BH35A	4.311	5.265	4.79
BH36	3.321	3.435	3.38
BH36A	3.026	3.275	3.15
BH37	4.15	3.99	4.07
BH37A	4.153	3.999	4.08
BH38	3.327	3.72	3.52
BH38A	2.691	3.374	3.03
BH39	4.406	4.357	4.38
BH40	4.945	4.878	4.91
BH41C	4.433	4.34	4.39
BH42	7.301	7.13	7.22
BH43	5.104	5.018	5.06

For inspection purposes only. Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04

Soil FOC Results

client sample ID / *Depth (m)*	*Units*	TT 53	TT 55	TT 57	BH 35	BH 35A	BH 36A	BH 37A	BH 38A	BH 39D	BH 40	BH 41C	BH 43
		4.5	3	4	3.4					6.5	4	3.5	4.2
Fraction of Organic Carbon	Fraction of 1	0.016	0.036	0.024	0.062					0.017	0.02	0.003	0.004
Fraction of Organic Carbon	%	1.6	3.6	2.4	6.2					1.7	2	0.3	0.4

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 29-05-2012:04:39:04