Off-site Impact Assessment 2016

18 August 2016

Project No. 60492969

Prepared for: Saint Gobain Building Distribution (ROI) Ltd.

Prepared by: AECOM Infrastructure and Environment Ireland Limited

REVISION SCHEDULE					
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TABLE OF CONTENTS

Executive Summary

AECOM, operating through its wholly owned subsidiary AECOM Infrastructure & Environment Ireland Limited (hereafter referred to as "AECOM") is pleased to present this report to Saint Gobain Building Distribution (ROI) Limited, trading as PDM Limited (PDM), which details the findings of the Offsite Surface Water and Sediment Impact Assessment at the PDM site at Oldmilltown, Kill, Co. Kildare (hereafter referred to as "the site").

The assessment presented here is carried out in the context of two Compliance Investigations (CI164 and CI165) initiated by the EPA in relation to discharges from the site to the surface water system of waters with elevated Polycyclic Aromatic Hydrocarbons (PAHs). The requirements of the EPA were formalised in a communication to PDM as follows:

> *"The licensee is required to further investigate the impact of PAHs in downstream water courses and should include:*
>
> 1. *Delineate the extent of impact by PAHs downstream of the site.*
> 2. *Identify and implement the necessary measures to mitigate the impact and risk posed to all receptors by elevated PAHs off-site and determine the corrective actions required to ensure there is no risk to these receptors.*
> 3. *The licensee shall ensure that there is no access to water with elevated PAHs e.g. Farmers Pond."*

Objectives

The objective of the works proposed herein is to address the above issues raised by the EPA, as reiterated in the update meeting of 27 April 2016.

Scope of Works

AECOM has completed, on behalf of PDM, a sediment sampling programme at 38 locations with the aim of assessing the extent and source of sediment contamination offsite. An assessment report (this document) was produced in line with EPA guidance and includes, where appropriate, historical surface water monitoring and ecological data from the site.

Summary of conclusions

Overall, the findings of the assessment reported herein indicate that PAH impacts in sediment and surface water do not extend far beyond the site boundary and that site activities and residual contamination would appear to have no significant adverse effect on the ecological status and quality of the local surface water system.

Contaminated sediments are generally localised between monitoring locations Licence Pt E and Final Exit Licence (approximately 550 m section) and between Licence Pt A and SW205 (approximately 200 m section). Very localised hot-spots of PAH contaminated sediments (low level contamination) are found further downstream in close proximity to roads and are deemed to be associated with combustion products from road run-off.

Contaminated sediments between Licence Pt E and Final Exit likely originate in part from on-site sources, as well as inputs from an off-site source from the neighboring third party storage yard. PAH double ratio plots were generally inconclusive, due to the significant weathering of PAHs that has occurred over time and the similarity of both identified potential PAH sources (creosote).

The potential risk to identified downstream surface water receptors (including livestock) is generally considered to be **low** or **negligible**. It is noted that upstream monitoring data also shows evidence of off-site sources of PAHs upstream of the site, with some upstream locations showing increasing trends.

Summary of Recommendations

A total of 12 actions are recommended to address the elements of concern. However, it is noted that 8 of these actions are already being implemented or are planned for implementation as part of the Outline Corrective Action Plan for the site. These include upgrading of the existing WwTP and drainage infrastructure (including SuDS), as well as the removal of identified contaminant hot-spots within the site footprint. In addition to these 8 planned/in-progress actions, it is recommended that livestock access to the section between Licence Pt E and Final Exit is prevented. Also, it is recommended that, at an appropriate time of the year (dry weather), this section of the ditch is dredged to remove the residual contaminated sediment and that the sediment sampling campaign is repeated after 2 years. Continued surface water monitoring is also recommended.

1. INTRODUCTION

AECOM Infrastructure and Environment Ireland Limited (hereafter referred to as "AECOM") is pleased to present this report to Saint Gobain Building Distribution (ROI) Limited, trading as PDM Limited (PDM), which details the findings of an offsite surface water and sediment impact assessment at the PDM site at Oldmilltown, Kill, Co. Kildare (hereafter referred to as "the site").

A site location map is presented in Figure 1.

2. BACKGROUND

PDM currently operates under an Integrated Pollution Control (IPC) Licence (Reg. No. P0325-01), as issued by the Environmental Protection Agency (EPA) in 1998.

Site activities comprise the manufacture and pressure impregnation by creosote and Osmose Naturewood® of timber products, namely poles, railway sleepers, posts, rails and round fencing.

The assessment presented here is carried out in the context of two Compliance Investigations (CI000164 and CI000165) initiated by the EPA in relation to elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) in surface water discharged from the site to local drains.

2.1 Previous Surface Water Impact Assessment

AECOM (operating as URS) completed a surface water impact assessment[1] for the site in 2015 in response to EPA CI000165. The recommendations of the 2015 report with regard to further surface water monitoring are summarised as follows (Figure 2 indicates the surface water sampling locations):

- Downstream sample point SW205, SW207 and Bridge 2 should be included in the regular surface water monitoring rounds and include analysis for PAHs and suspended solids;
- Regular monitoring results should be assessed for trends in individual PAHs and any significant upward trends in PAH concentration should be highlighted;
- PAH results should be assessed in more detail (where possible) to identify the potential sources of PAHs at each monitoring point and to differentiate between offsite and onsite sources; and
- Drainage from the third-party property adjacent to Licence Pt A should be included in regular monitoring, including analysis for PAHs and suspended solids.

In addition to the above, AECOM recommended that the monthly monitoring should include:

- Sampling upstream of the site to assess trends in background PAH concentrations, and;
- Sampling of the existing surface water monitoring points on site to assess trends in PAH concentrations within the site.

In response to the Surface Water Impact Assessment Report[1], the EPA made the following comments:

> *"It is noted that while concentrations of PAHs in surface water were not detected above the EQS for the individual PAHs to which standards apply, at monitoring points Bridge 2 and SW207, elevated concentrations of the total 16 PAHs were detected at 0.23ug/l and 0.28ug/l in November 2014 respectively. Similarly, total PAHs were detected at SW206 at 0.2ug/l in October and December 2014. Total PAHs were below the lab detection limit in the upstream samples at SW201, SW202 and SW203 in October, November and December 2014.*
>
> *It is noted that sediment showed PAH contamination at off-site monitoring locations SS202, SS203, SS204 and SS206. The Agency considers that additional sediment samples need to be taken at Final Exit, Bridge 2 and downstream of SS206 in order to delineate the extent of sediment affected by PAHs.*

[1] URS Ireland Limited, *Surface Water Impact Assessment,* Project Ref. 47092796, 13 March 2015

The licensee is required to inform the Agency as to what action is proposed in relation to the remediation of contaminated sediment detected on-site at the former ditch by the lagoons and off-site.

The Agency considers sufficient evidence exists to demonstrate potential impact on downstream watercourses. The licensee is required to investigate further and should include the following:

- *Additional surface water monitoring downstream of SW207 in order to delineate the extent of impact by PAHs.*
- *Delineate the extent of impact downstream of the site,*
- *Identify and implement necessary measures to mitigate the impact and risk posed by elevated PAHs off-site and for their remediation*

2.2 Q1 Surface Water Monitoring 2016

AECOM completed the following scope of works during the Q1 2016 surface water monitoring round to provide the information requested by the EPA in their communication:

- Collection and analysis of surface water samples monthly from 19 surface water sample locations;
- Collection and analysis of 6 sediment samples from sample locations upgradient and downgradient of the site; and
- Data assessment and reporting.

The findings of the Q1 2016 surface water monitoring are summarised as follows:

- Individual PAH compounds were reported above the relevant detection limit at background sample location points (SW202, SW206, SW210, SW211 and Upstream PDM 1), indicating potential PAH sources in the area other than the site.
- Reported concentrations of PAHs were reported above the surface water threshold values (SWTVs) at background sample location points SW101 and SW206.
- Reported concentrations of PAHs were above the emission limit values (ELVs) specified in the site's IPC licence and SWTVs at Licence Pts A and E in Q1 2016 indicating a potential risk to surface waters receptors.
- An upward trend was noted in Total (16) PAH concentrations for sample point Licence Pt A. Continuing analysis of the trends at Licence Pt A was recommended following the interim remedial works in the catchment of this drain location completed in 2015 and the planned implementation of the remainder of the corrective action plan for this location in 2016.
- Zinc was reported above the SWTV at 66m from Oman (within the site footprint) and SW205 during Q1 2016. Further monitoring was recommended to assess any trend in the detection of zinc at these points. Zinc was not reported above the SWTVs in any of the other surface water samples collected in Q1 2016.
- Reported concentrations of PAHs above the site's ELV were reported for Licence Pt E in Q1 2016. Further analysis of the trends in PAH concentrations was recommended following planned drainage and surfacing upgrade works in 2016.
- The elevated concentrations of PAHs reported at downstream monitoring points SW207, Bridge 2, SW212 and SW213 were considered likely to be in part associated with emissions at Licence Pt E and A, but the disparity in reported concentrations between the site emission points and the downstream sample points in Q1 2016 indicated that a significant but unquantified proportion of the PAHs reported were likely to be from sources other than the PDM emission points.
- Potential risks to surface waters were reported for elevated concentrations of zinc, copper and PAHs in the sediment samples collected. It is noted however that the sediment assessment criteria are based on soil:water partitioning equations and are considered very conservative. For this reason, more emphasis was placed on the actual surface water samples results.

During an update meeting with the EPA on 27 April 2016, the EPA requested that PDM provide additional information on the following potential offsite issues:

- Extent and source of sediment contamination offsite;

- Potential risk to agricultural receptors (livestock and farm workers); and
- Where impact is observed, provide recommendations for remediation.

The requirements of the EPA were formalised in a communication to PDM as follows:

> *"Further to the recent report 'PDM Q1 Surface Water Monitoring 2016' submitted through compliance investigation CI000165 on the 8th April 2016, the Agency makes the following comments. The licensee is required to further investigate the impact of PAHs in downstream water courses and should include:*
>
> 1. *Delineate the extent of impact by PAHs downstream of the site.*
> 2. *Identify and implement the necessary measures to mitigate the impact and risk posed to all receptors by elevated PAHs off-site and determine the corrective actions required to ensure there is no risk to these receptors.*
> 3. *The licensee shall ensure that there is no access to water with elevated PAHs e.g. Farmers Pond."*

3. OBJECTIVES

The objective of the works proposed herein is to address the three (3) specific issues raised by the EPA in the update meeting of 27 April 2016, as follows:

- Assess the extent and source of sediment contamination offsite;
- Assess the potential risks to agricultural receptors (livestock and farm workers) and surface waters; and
- Where appropriate, provide recommendations for remediation.

4. SCOPE OF WORKS

In order to achieve the objectives outlined in Section 3, the following scope of works was completed by AECOM on behalf of PDM:

- Collection of thirty-eight (38) sediment samples from drains and streams upstream, downstream and on the site;
- Submission of samples to an accredited laboratory for PAH analysis; and
- Data assessment and reporting.

On receipt of the laboratory results, AECOM produced an assessment report (this document) in line with EPA guidance[2]. The report herein includes a summary of the works completed, an assessment of the extent of and the potential risks from PAH concentrations reported in sediment and recommendations for remediation, where appropriate. The report also includes relevant surface water data that has previously been collected offsite as part of the routine surface water monitoring programme for the site.

It is noted that a number of risk assessments have been completed previously for the site and a programme of infrastructure upgrade works is currently underway[3,4]. The work presented here, will therefore focus on the downstream impacts on the surface water system which are deemed to be mostly associated with discharges from the site (through Licence Pts A and E) and on residual sediment contamination.

5. PREVIOUS INVESTIGATIONS

It should be noted that significant investigation work has been undertaken on the site to date and the report presented herein should be read in conjunction with the following reports:

[2] EPA (2013) *Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites*

[3] AECOM (2016) *Outline Corrective Action Plan for Licence Pt A*

[4] AECOM (2016) *Outline Corrective Action Plan for Licence Pt E*

- URS (2014) *Detailed SI and DQRA 2014*. Ref: DURP00001. Dated 15 Oct 2014.
- URS (2015) *Additional Targeted SI 2015*. Ref: 47092882. Dated 24 April 2015.
- URS (2015) *Surface Water Impact Assessment*. Ref: 47092796. Dated 13 March 2015.
- AECOM (2015) *Excavation of Sediment in Drainage Ditches to Licensed Emission Points A&D.* Dated 08 July 2015.
- AECOM (2015) *PDM Q1 Surface Water Monitoring 2015.* Dated 30 April 2015.
- AECOM (2015) *PDM Q2 Surface Water Monitoring 2015.* Dated 13 July 2015.
- AECOM (2015) *PDM Q3 Surface Water Monitoring 2015.* Dated 27 October 2015.
- AECOM (2016) *PDM Q4 Surface Water Monitoring 2015.* Dated 12 January 2016.
- AECOM (2016) *PDM Q1 Surface Water Monitoring 2016,* Dated 8 April 2016.

6. SITE DESCRIPTION

The site is located in Oldmilltown, Kill, Co. Kildare. The site is situated approximately 25km south-west of Dublin city centre and has been in operation since 1968, specialising in the manufacture and pressure impregnation of wood products with preservatives. There are currently 35 people employed at the site. Prior to 1968 the site and the surrounding land was undeveloped and understood to have been used for agricultural purposes.

The primary Contaminant of Potential Concern (CoPC) at the site is creosote, which has been used in the pressure treatment of timber products since the inception of the facility (other timber treatment products (discussed below) were later used alongside creosote).

Site details are summarised below:

- Site ID – Saint Gobain Building Distribution - trading as PDM.
- Site location - Oldmilltown, Kill, Co. Kildare
- National Grid Reference – 297740, 222635
- Current operation – manufacture and storage of pressure treated timber products.
- Site Area – The PDM site occupies an area of approximately 16 hectares

6.1 Historic Pollution Incidents

A January 2004 report produced by PDM and anecdotal evidence obtained during the site interviews on 26 May 2014 indicates that there was historically (up to the early 1970s) an unsealed excavation in the vicinity of the south-western corner of Treatment Area 1 that was grossly contaminated by creosote. Blow down from Treatment Areas 1 and 2 also vented into this area. No information regarding clean up works in this area was available. An underground concrete chamber is now present in this area, which is understood to have been installed to take the blow down from the adjacent treatment plant.

The shallow surface water drain to the northwest of this area was also reported to have been impacted by poor creosote handling practices in this area. PDM has periodically undertaken remediation works in this drain in the past, consisting of the dredging of sediment from the drain.

It is understood that there was no single pollution incident associated with the contamination reported in this portion of the site, rather cumulative impact due to poor creosote handling practices during offloading and treatment was the attributed cause. The volume of product released could not be ascertained, as stock reconciliation was not carried out on site at that time.

Another former practice on site that was identified during site interviews as a potentially contaminating activity was the decanting of creosote from delivery trucks to 5 and 45 gallon drums. Two areas were pointed out by current staff as having been used for this activity. Again, it is

understood that there was no large single pollution incident associated with this practice; instead poor handling practices resulted in the loss of creosote to ground in these areas over an extended operational period. It is understood that this practice was discontinued in the early 1990's and that 5 and 45 gallon drums are now filled from a storage tank in Treatment Plant 1 and 2. The volume of product lost to ground during this activity also could not be ascertained.

With the exception of poor practices during the offloading and handling of creosote in the treatment and storage areas, the former practice of storing treated wood in unsealed areas and the occurrences outlined above, there are no known other instances or incidents that could have given rise to soil / groundwater contamination.

6.2 Surrounding Land Use

Surrounding land use is dominated by agricultural activities, with some industrial, commercial and residential activities also present. Land-use in the vicinity of the site at the time of this site assessment is summarised below.

Site Boundary	*Land Use*
North	Commercial Units / Agricultural / Low Density Residential
South	Agricultural
East	Agricultural
West	Electricity Supply Board (ESB) Pole Yard used for the storage of creosote treated poles

6.3 Environmental Setting

A description of the general environmental setting of the site is provided in the table below.

Physical Feature	*Description*
Surface of site	The ground surface is a mixture of unsealed ground (estimate 70%), concrete pads to store treated wood (~20%) and building footprints (~10%).
Topography	Site topography slopes gradually downward towards the north-west. The site ground elevation is estimated to be approximately 150 metres (m) above Ordnance Datum (Mean Sea Level - Malin Head, Co. Donegal). Ground levels south-east of the site increase more steeply up to the village of Kilteel (230 m above Ordnance Datum (mAOD)) which lies 1.5 km to the south-east of the site, and to various higher points in the hills further to the east and south of the site.
Soils	The overburden soils consist of made ground and till (glacial sediment derived from Lower Palaeozoic rocks or derived from limestone), (*Geological Survey of Ireland (GSI) website; (www.gsi.ie); RBD Subsoils*). Based on GSI information and previous investigations, the overburden soils at the site predominantly comprise gravelly clay with some gravel lenses.

Physical Feature	*Description*
Regional Geology	Geology underlying the site is indicated to comprise greywacke sandstones and shales of the Tipperkevin Formation in the south-western part of the site and Silurian Metasediments and Volcanics, consisting of calcareous greywacke, siltstone and shale of the Carrighill Formation of the Silurian Kilcullen Group, in the north-western part of the site (*Geological Survey of Ireland (GSI*) *website; (www.gsi.ie); National Draft Generalised Bedrock Map)*. Previous investigation completed at the PDM site indicates that there is a weathered bedrock layer in the upper 2-3 metres of the bedrock. Historic drilling data indicate that the depth to bedrock varies between approximately 5 m bgl at the northern end of the PDM site and 13 m bgl at the southern end of the site.
Regional Hydrogeology and Aquifer Classification	The site is underlain by the Kilcullen Groundwater Body, which has a 'good' status according to the Water Framework Directive Ireland website (*www.wfdireland.ie*). The bedrock underlying the site is classified by the Geological Survey of Ireland as a 'poor' aquifer (generally unproductive except for local zones or bedrock which is generally unproductive), with a 'moderate' or 'low' vulnerability rating. No gravel aquifer is indicated as underlying the PDM site on the National Draft Gravel Aquifer Map (*GSI website,* (*www.gsi.ie)*; *Groundwater Vulnerability Map of Ireland*). In addition, according to the GSI website there is no Source Protection Zone recorded within a 2 km radius of the site.
Inferred Groundwater Flow	Based on the topography of the site and the surrounding area, regional groundwater flow direction is likely to be to the west or north-west. In addition, previous site investigations at the PDM site indicate that the inferred groundwater flow direction follows the topography to the west / north-west. At a site level, groundwater flow may be influenced by local abstraction of groundwater by PDM from one bedrock well (reported to be 500ft (~153 m) in depth) located in the eastern part of the site and by a well used on the former Thorntons area of the site. However, evidence of this has not been observed during previous assessments of groundwater flow at the site. The PDM well supplies domestic water for the canteen and office and water for the boiler and other miscellaneous uses including vehicle washing. The Thorntons well is understood to have been decommissioned in 2015. In addition, since the installation of the groundwater containment system in 2012, pumping at well MW12 near the western site boundary has resulted in a local groundwater gradient towards MW12 in that area of the site.

Physical Feature	*Description*
Nearby Groundwater Abstraction Wells	There are two groundwater abstraction wells on or adjacent to the site: • A groundwater abstraction well associated with PDM is located approximately 100m east (up hydraulic gradient of the Treatment Plant 1 and 2 areas), which supplies supplies domestic water for the canteen and office and water for the boiler and other miscellaneous uses including vehicle washing.. • A groundwater abstraction well associated with the former Thorntons Wood Recycling Facility is located approximately 100m south-east (up hydraulic gradient) of the source area. This was previously used to supply the Thorntons site office and a 10,000L water AST which supplied the machinery sprinkler system. It is understood that the well was decommissioned when Thorntons vacated the site in 2015. A search of the GSI well database (*GSI website, (www.gsi.ie)*; *accessed 04 August 2016*) found 7 registered groundwater wells located within 1.5km radius of the site. All but two of these wells are located up hydraulic gradient of the site. A summary of the 7 wells is presented below: • A well (locational accuracy to 50m) installed to a depth of 15.5m bgl with an unknown use is located 1 km west of the site at Porterstown. (GSI Code: 2921NWW250) • A dug well (locational accuracy to 50m) installed to a depth of 3.9m bgl with an unknown use is located 1.28 km south-east of the site at Kilteel Upper. (GSI Code: 2921NWW251) • A well (locational accuracy to 1km) installed to a depth of 13.1m bgl with an unknown use is potentially located 845 m south-east of the site at Kilteel. The yield of this well is described as 'good'. (GSI Code: 2921NWW118) • A well (locational accuracy to 1km) installed to a depth of 9.5m bgl with an unknown use is potentially located 1260 m north of the site at Quinsborough. The yield of this well is described as 'poor' (27.3m^3/day). (GSI Code: 2921NWW112) • A well (locational accuracy to 1km) installed to a depth of 91.4m bgl listed as domestic use is potentially located 1480 m south of site at Furryhill. (GSI Code: 2921NWW125) • A well (locational accuracy to 2km) installed to a depth of 12.2m bgl with an unknown use is potentially located 1 km south of the site at Furryhill. The yield of this well is described as 'good'. (GSI Code: 2921NWW116) • A well (locational accuracy to 2km) installed to a depth of 30.5m bgl with an unknown use is located 0.8 km west of the site at Porterstown. The yield of this well is described as 'poor'. (GSI Code: 2921NWW117) There are no other recorded wells within 1.5 km of the site. However, it is noted that there is no requirement to register wells with the GSI, and, given the rural setting of the surrounding area, it is considered possible that non-registered groundwater supply wells are present.

Physical Feature	*Description*
Nearby Surface Water Bodies	A search of the EPA Envision GIS viewer on the EPA website (*www.epa.ie, accessed 12 July 2016*) revealed a number of streams and rivers in the area surrounding the site: • Killhill Stream located 400 m to the north-northwest; • Newrow Stream located 450 m to the north; • Kilwarden Stream located 420m to the south-west; • Blackchurch River 850 m to the north-northeast, which flows into the Kill East River 1.1km north of the source; • Farmersvale River, which flows into the Blackchurch River 750 m to the north-east; and • Blackhill Stream located 1.2 km to the west. All the above surface water features flow west to north-west and eventually enter the Painestown River, located 3.4 km west of the site. The Painestown River flows to the north-west and discharges into the Morrell River, and then subsequently into the River Liffey, located approximately 8 km north-west of PDM. The river quality of the Painestown River near the site (WFD ID: Painstown_10), including the Killhill section, is classified by the EPA as having 'Poor Status' and 'At Risk' of not achieving good status in the future. (*www.catchments.ie, accessed 12 July 2016*) The Blackchurch River (WFD ID: Morell_040 is currently classified as having 'Good Status' and 'Not at Risk' of not achieving good status in the future. There are open surface water drains located between the Painestown River and the PDM site, running along the up hydraulic gradient eastern boundary of the PDM site, and along the down hydraulic gradient western boundary (~150m west of the site) of the neighbouring ESB site. These drains are identified as pertaining to the Killhill Stream (from Final Exit onwards) on the EPA Envision viewer and tend to follow internal roadways and boundary lines but regionally they flow towards the north-west following topography. The surface drains are understood to be of relatively low volume and flow rates, compared to local rivers, and it is understood that they have been observed to dry out during summer periods. These drains receive surface run-off from nearby roads and also from a third party creosote treated pole storage area (separate to the PDM site).
Nearby Flood Risk Areas	According to the OPW flood risk website (*www.floodmaps.ie, accessed 8 August 2016*) there are no recurring flood events within 1km of the site.
Environmentally Sensitive Areas	Groundwater beneath the site is protected as a drinking water resource under the Water Framework Directive. According to the National Parks and Wildlife Service website (*www.npws.ie, accessed 8 August 2016*), Kilteel Woods, approximately 850 m to the south-east, is a proposed Natural Heritage Area (pNHA) There are no other designated environmentally sensitive areas within 1.5km of the site.
Radon	As detailed in radon maps prepared by the RPII, the site is located in an area with 1% to 5% of properties in a 10km grid square that are estimated to be above the 200Bq/m^3 reference level for radon (= Low radon area). Grid squares in which the predicted percentage of properties is 10% or greater are called High Radon Areas.

Physical Feature	Description
Other	There are no EPA licenced IPC or Waste facilities located within a 1km radius of the PDM site. The Thorntons Wood Recycling facility previously located on the southern portion of the site holds a Waste Facility Permit (WFP-KE-10-0061-01) issued by Kildare County Council. According to the information available from NWCPO website (*facilityregister.nwcpo.ie, accessed 9 August 2016*) the waste permit lapsed on the 6 May 2016 and was not renewed.
Sensitive Receptors	Sensitive receptors identified within 1km of the site include: • Protected groundwater beneath the site; • Groundwater abstraction wells located at the PDM site, which supplies water to the PDM site offices and facilities; • The nearest off-site surface water feature, the Killhill Stream, located 400 m west of the site. This is the main subject of this assessment; • The nearest off site groundwater abstraction well located down hydraulic gradient of the site is 1km west of the site at Porterstown. It is noted that the site overlies a designated 'Poor' aquifer. Although, the groundwater abstraction well associated with the PDM site is located up hydraulic gradient of the site, it has been identified as sensitive receptor given its close proximity to the areas where known historical contaminant releases occurred. All remaining off site groundwater wells identified within a 1.5km radius of the site are located up hydraulic gradient of the source area and, as such, are not identified as sensitive receptors.

7. METHODOLOGY

7.1 Sediment Sampling

A total of 38 sediment samples were collected by an AECOM field scientist in accordance with AECOM's "Field Procedure FP05 - Surface water, tap water and sediment sampling". A sediment sample log was compiled for each sample location and any field evidence of contamination in the form of odours and staining was recorded. Where possible, an assessment of the depth of the sediment sample was completed. Photo-ionisation detector (PID) readings were recorded for each sediment sample. The rationale for the selection of sediment samples is described in the table below. A location map of the sampling locations is provided in Figure 2 attached.

Sample Point	Rationale
SS501 to SS512	The highest concentrations of PAHs in sediment were detected between Licence Pt E and Final Exit during previous investigations. Samples were collected at 50m intervals along this ditch to assess if remediation works are required.
SS513 to SS516	Sediment samples were collected at approximately 100m intervals between Final Exit and SW207. The analytical results were used to assess the trend in sediment sample concentration as you move away from the key potential sources on the site and adjacent third party pole storage yard.
SS517 to SS520	Sediment samples were collected at approximately 100m intervals between Final Exit and Bridge 2. The analytical results were used to assess the trend in sediment sample concentration as you move away from the key potential sources on the site and on the adjacent third party pole storage yard.
SS521 to SS526	Sediment samples were collected at approximately 100m intervals between Licence Pt A and Bridge 2. The analytical results were used to assess the trend in sediment sample concentration as you move away from Licence Pt A. It is noted that the flow from Licence Pt A is culverted between the licence point and the L2019 roadway – a distance of ~350m immediately downstream of Licence Pt A.

Sample Point	Rationale
SS527 to SS531	Sediment samples were collected at approximately 200m intervals between SW207 and SW213. The analytical results were used to assess the trend in sediment sample concentration further downstream of the site towards the N7.
SS532 to SS536	Sediment samples were collected at 200m intervals between Bridge 2 and SW212. The analytical results were used to assess the trend in sediment sample concentration further downstream of the site towards the N7.
Farmers Pond Sed 1 and Farmers Pond Sed 2	Sediment samples were collected in the Farmer's Pond in order to assess the potential presence of contaminants possibly contributing to the PAH concentrations in surface water samples from this location. (surface water samples collected during a previous event in April 2016).

All samples were collected in dedicated containers provided by the laboratory and dispatched to the contract analytical laboratory in cooler boxes with appropriate chain-of-custody documentation. Sediment samples were submitted to Jones Laboratories in the UK (an AECOM-approved laboratory) for the following analysis.

Parameter	No. of Primary Samples	No. of Duplicate Samples
Speciated 16 PAH[Note 1]	38	1

Note 1: Where the concentrations of heavy molecular weight (HMW) PAHs are appropriately high, a double ratio PAH plot has been produced to attempt to identify the source of the PAH impact and potentially differentiate between sources (if more than one is detected).

7.2 Surface Water Data Analysis

Historical surface water sampling data was analysed for the purpose of carrying out trend analysis and determining average concentrations. The following methods were employed:

- Trend Analysis was carried out using Mann Kendal Trend with a Confidence = 0.1. Locations where less than 10 data points were available were discounted from the assessment due to the poor statistical representativeness.
- Values below the Detection Limit (DL) were assumed equal to 0.5 x DL when calculating average concentrations.

All environmental data was managed and analysed using the environmental database system ESdat™ (www.esdat.net).

7.3 Assessment Criteria

Following the identification of viable Source-Pathway-Receptor linkages, a risk-based approach has been adopted for the assessment of analytical data. The surface water and sediment data was screened against generic assessment criteria (GAC) considered appropriate within the context of the environmental setting. Constituent concentrations in surface waters or sediment are deemed 'potentially significant' where they exceed GAC. GAC are used for initial screening of contaminant concentrations and, as such, it should be noted that GAC values exceedances are not an indication of the requirement for remediation, but rather an indication of the need for further assessment or evaluation.

In the absence of a generally agreed scale, exceedances are qualified in accordance with the following table:

GAC multiplier	Exceedances	Potential Risk
<1 x GAC	None	Negligible
1x to 2x GAC	Marginal Exceedance	Low
2x to 10x GAC	Minor Exceedance	Low
10x to 100x GAC	Moderate Exceedance	Moderate
>100 x GAC	Significant Exceedance	Significant (or Potentially Serious)

7.3.1 *Livestock (Surface Water Data)*

To assess potential risks posed by surface water used as a watering source for livestock, GACs were derived from *Publication Number 4733 - Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (API, 2004).* A conservative approach was taken and the lowest published GACs were employed (screening criteria for the protection of calves).

7.3.2 *Livestock (Sediment Data)*

To assess the risks posed by ingestion of soil particles from livestock, GACs were derived from *Publication Number 4733 - Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (API, 2004).* A conservative approach was taken and the lowest published GACs were employed (screening criteria for the protection of horses).

7.3.3 *Surface Waters (Surface Water Data)*

In terms of potential risk to surface waters from concentrations of PAHs in surface water, appropriate GAC were obtained in consideration of the following legislation and guidance:

- *Statutory Instrument No. 386 of 2015 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015 -MAC-EQS Inland* (for the assessment of individual monitoring events)
- *Statutory Instrument No. 386 of 2015 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015 - AA-EQS Inland* (for the assessment of average concentrations)
- *EPA 2003, Towards Setting Guideline Values for the Protection of Groundwater in Ireland – Interim Guideline Values (EQS for surface water)*

7.3.4 *Surface Waters (Sediment Data)*

In terms of risk to surface waters from concentrations of PAHs in sediments, GAC for the protection of surface waters were derived from the sediment results using a theoretical soil:water partitioning coefficient. However, such GAC are likely to be very conservative and, consequently, greater reliance is placed on actual surface water data from the surface water drains and streams on and beyond the site when assessing the potential risks to controlled waters receptors in the vicinity of the site.

8. CONCEPTUAL SITE MODEL SUMMARY

The conceptual site model (CSM) presented below identifies viable surface water Source-Pathway-Receptor (S-P-R) linkages at the site and has been derived from the CSM presented in the 2015 Surface Water Impact Assessment[1]. It is noted that some of the S-P-R linkages are no longer deemed viable due to upgrade works and remedial efforts subsequently completed by PDM at the site, in particular:

1. Surface water collected at Licence Pt D has been conveyed to the Wastewater Treatment Plant (WwTP) since July 2015 and offsite discharges from this location are no longer occurring.

2. Drainage Ditch 2 (leading to Licence Pt A) and Drainage Ditch 1 (leading to Licence Pt D) were dredged to remove contaminated sediment in May and July 2015.

3. A number of pads dedicated to the storage of treated timber have been upgraded with impermeable surfaces and water collectors leading to the WwTP.

4. Overland flow from the production area has been directed to Drainage Ditch 4, which is in turn conveyed to the WwTP (this is a temporary solution pending completion of planned/in-progress site wide drainage upgrade works).

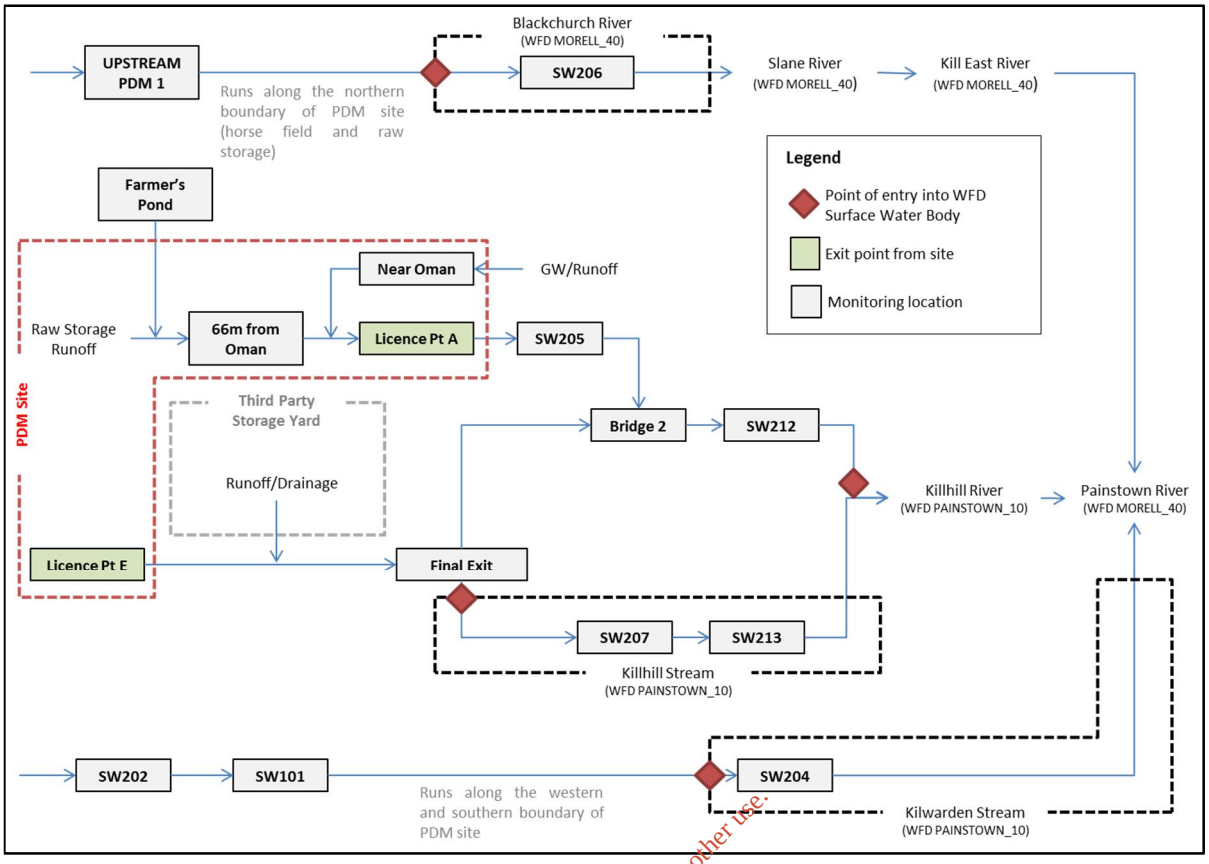
5. Improved cleaning and inspection practices have been implemented to limit creosote impacts on surface runoff.

Conceptual Site Model

Key Sources	*Potential Pathways*	*Potential Receptors*
Creosote Storage and Treatment Areas, Main Site Separator. (Point Source)	Flow to surface water drainage network via gullies and emission at Licence Pt E via WWTP	Kill River, Killhill River and Painestown River.
	Overland flow directly offsite bypassing surface water drains and surface water drainage network.	
Treated product storage areas. (Point Source)	Flow from local gullies to drainage network, WWTP and emission at Licence Pt E.	
	Overland flow offsite during periods of high rainfall.	
	Overland flow to drainage ditches leading to Licence Pts A and D during periods of high rainfall.	
Overflowing of drainage network (manhole MH8) adjacent to Licence Pt D. (Point Source)	Overland flow to licence Pt D.	
Contaminated soil across the site (including soil stockpiles) (Diffuse source).	Overland flow to drainage ditches and emission at Licence Pts A and D	
	Overland flow to site surface water drainage network to WWTP and emission at Licence Pt E	
	Overland flow to former drainage ditch at south-western end of site, pumping to WWTP and emission at Licence Pt E.	
	Overland flow directly offsite bypassing surface water drains and surface water drainage network.	
Contaminated sediment in drains leading to Licence Pts A and D (Diffuse source).	Flow in drainage ditches to Licence Pts A and D.	
Contaminated sediment in the drainage network (Diffuse source).	Flow of surface water through the network to Licence Pt E.	

9. SURFACE WATER CONNECTIVITY

A schematic representation of the current surface water connectivity of the site is illustrated below. A site layout map showing the location of each of the surface water monitoring points is provided in Figure 2. It is noted that flows from UPSTREAM PDM1 and SW202 are not deemed to enter the site but the streams are understood to flow adjacent to the site boundary.



10. RESULTS

10.1 Field Observations

Field observations noted during the sediment sampling are presented below.

Sample ID	*Comment*	*PID Reading (ppm)*
SS501	Dark brown, black silty clay with organic matter. Olfactory evidence of organic decomposition and creosote odour.	0.0
SS502	Dark brown and black/grey, stiff, silty clay. Olfactory evidence of organic decomposition and creosote odour.	0.0
SS503	Clay with dominant organic matter component. Olfactory evidence of organic decomposition and strong creosote odour. Hydrocarbon sheen noted to be forming in water when sediment is disturbed.	0.0
SS504	Mostly organic deposit with minor quantities of layered silty clay. No Evidence of Contamination (NEC).	0.0
SS505	Dark brown clay with dominant organic matter component. Slight hydrocarbon sheen noted to be forming in water when sediment is disturbed.	0.0
SS506	Dark brown silty clay with dominant organic matter component. Olfactory evidence of organic decomposition and slight creosote odour.	0.0

Sample ID	Comment	PID Reading (ppm)
SS507	Dark brown clay with silt and organic matter. Evidence of organic decomposition and slight creosote odour. Hydrocarbon sheen noted to be forming in water when sediment is disturbed.	0.0
SS508	Dark brown, soft clay with high organic matter content. Olfactory evidence of organic decomposition and slight creosote odour. Hydrocarbon sheen noted to be forming in water when sediment is disturbed.	0.3
SS509	Dark brown, silty clay with moderate organic matter content. Evidence of organic decomposition and creosote odour.	0.4
SS510	Brown, slightly silty sand with gravel. No organic matter noted. Strong creosote odour. Evident hydrocarbon sheen noted to be forming in water when sediment is disturbed.	3.4
SS511	Dark brown, soft, slightly silty clay with moderate organic matter content (mostly fresh). No odours noted. Slight hydrocarbon sheen noted to be forming in water when sediment is disturbed.	0.0
SS512	Dark brown, very soft, silty clay. Organic matter component increasing with depth. Olfactory evidence of organic decomposition. Hydrocarbon sheen noted to be forming in water when sediment is disturbed.	0.0
SS513	Brown, sandy, slightly silty clay with gravel and organic matter. Slight evidence of organic decomposition. NEC.	0.0
SS514	Brown silt with clay and organic matter. Evidence of organic decomposition deeper in the profile. NEC.	0.0
SS515	Brown, slightly silty gravel with some organic matter. NEC.	0.0
SS516	Brown gravel. Small pile of rubble/waste noted along the bank possibly leaching in to the stream.	0.0
SS517	Dark brown silt with high organic matter content. Evidence of organic decomposition.	n/a
SS518	Dark brown silt with organic matter component. Slight olfactory evidence of organic decomposition.	n/a
SS519	Dark brown/black silt with high organic content. Moderate olfactory evidence of organic decomposition.	n/a
SS520	Light brown, dry clay with roots. NEC.	n/a
SS521	Brown, soft, silty clay. Slight olfactory evidence of organic decomposition.	n/a
SS522	Black, soft silt with organic matter and roots. Olfactory evidence of organic decomposition. Area overgrown with reeds.	n/a
SS523	Dark brown, soft, silty clay. NEC.	n/a
SS524	Brown, soft silt with gravel. NEC	n/a
SS525	Dark brown, dry, slightly silty sand with gravel and minor organic matter content.	n/a

Sample ID	Comment	PID Reading (ppm)
SS526	Dark brown, dry, loose topsoil with high organic matter content.	n/a
SS527	Brown, slightly silty sand with organic matter. No evidence of organic decomposition.	n/a
SS528	Brown, slightly silty sand with organic matter. Evidence of organic decomposition.	n/a
SS529	Dark brown, silty, gravelly sand with organic matter.	0.0
SS530	Brown, silty gravel and sand with organic matter component. NEC.	0.2
SS531	Light brown, slightly silty, slightly gravelly clay. NEC.	0.1
SS532	Brown, slightly silty gravel. NEC.	0.0
SS533	Dark brown, very soft, clayey silt with organic matter. Evidence of organic decomposition. Slight biological sheen noted on water.	0.0
SS534	Dark brown, very soft, clayey silt with organic matter. Evidence of organic decomposition. NEC.	0.2
SS535	Brown, soft, slightly gravelly silt with organic matter component. Olfactory evidence of organic decomposition. NEC.	0.0
SS536	Brown, soft, slightly gravelly, clayey silt with organic matter. Evidence of organic decomposition. NEC.	0.0
Farmers Pond Sed 1	Dark brown loose gravelly clayey SILT with frequent organic matter. NEC.	0.0
Farmers Pond Sed 2	Grey/dark brown gravelly SILT/CLAY with some organic matter (twigs, leaves and algae) and occasional fragments of timber. NEC.	0.0

n/a: value not available due to instrument malfunction

10.2 Livestock (Sediment Data)

Sediment data (Table 1) collected from the surface water system downgradient of the site and from the Farmer's Pond was screened against the selected GACs protective of livestock. The table below summarises the exceedances reported.

Parameter	Screening Value (mg/kg)	Exceedances
Low Molecular Weight PAHs	21.2	Marginal Exceedances: SS202, SS501, SS503, SS505 and SS506 Minor Exceedances: SS502 and SS510
High Molecular Weight PAHs	106.0	None

The results show that exceedances are limited to the section of drain between Licence Pt E and Final Exit, which is scarcely accessible to livestock. Additionally, the GACs selected were developed assuming continued ingestion of soil during grazing of livestock over the area contaminated (i.e. grazing contaminated grassland), which is deemed very conservative when considering sediment

which could only be ingested by livestock when drinking. AECOM understands that this section of the surface water drain is not currently used as a livestock watering source.

It is noted that that both samples from the only known livestock watering source, the Farmer's Pond, showed PAH levels in sediments below the relevant GAC's and therefore risks to livestock are considered negligible at this location.

10.3 Livestock (Surface Water Data)

Surface water data (Table 2) collected between September 2014 and June 2016 from surface water monitoring locations around the site (including the Farmer's Pond) were screened against the selected surface water GACs protective of livestock. None of the parameters considered exceeded the relevant surface water GAC.

10.4 Surface Waters (Sediment Data)

With the exception of sediment samples SS528, SS530, SS531 and SS532, reported PAH results for sediment samples showed at least one PAH compound exceeding the relevant GAC protective of surface water (predominantly the PAH compounds anthracene and fluoranthene). However, owing to the conservatism inherent in the soil:water partitioning calculation approach used to calculate the GACs protective of surface water from the sediment results, more emphasis is place on the actual surface water results discussed below when assessing potential risk to controlled water receptors.

10.5 Surface Waters (Surface Water Data)

Surface water data collected between September 2014 and June 2016 from surface water monitoring locations on-site and off-site (including the Farmer's Pond) are presented in Table 2 and screened against the GACs protective of surface waters. Calculated average values for each location are presented in Table 3? screened against the GACs protective of surface waters.

Since Total PAH 16 discharges are regulated by the site's IPC Licence, these are discussed here for illustrative purposes. It is noted that the conclusions drawn in relation to Total PAH 16 are generally consistent with those derived for individual PAH species.

Details of the Mann Kendal Trend analysis for PAH 16 is presented in Table 4.

The percentage of GAC exceedances and trends for Total PAH 16 for surface water data collected between September 2014 and June 2016 are summarised and presented in the following table.

Location	*Description*	*WFD – SWB*	*Exceedances (% of samples)*	*Trend (average concentration)*
SW101	Upstream Location	Not a WFD SWB	39%	Up (0.75µg/L)
SW202	Upstream Location	Not a WFD SWB	26%	Up (0.24µg/L)
SW210	Upstream Location	MORELL_040	7%	No trend (<0.195µg/L)
SW211	Upstream Location	RATHMORE STREAM_010	0%	No trend (<0.195µg/L)
Upstream PDM 1	Upstream Location	Not a WFD SWB	44%	Up (1.1µg/L)
Licence Pt A	Site Discharge	Not a WFD SWB	71%	Up (1.1µg/L)
Licence Pt E	Site Discharge	Not a WFD SWB	52%	Down (0.58µg/L)
Final Exit	Downstream Location	PAINESTOWN_010 (starting point)	89%	Up (1.6µg/L)
SW205	Downstream Location	Not a WFD SWB	36%	No trend (0.66µg/L)

Location	Description	WFD – SWB	Exceedances (% of samples)	Trend (average concentration)
SW207	Downstream Location	PAINESTOWN_010	36%	Down (0.73µg/L)
Bridge 2	Downstream Location	Not a WFD SWB	38%	No trend (0.38µg/L)
SW212	Downstream Location	Not a WFD SWB	50% (only 6 monitoring events to date)	No trend (0.21µg/L)
SW213	Downstream Location	PAINESTOWN_010	20% (only 5 monitoring events to date)	No trend (0.37µg/L)
SW204	Side-gradient Location	PAINESTOWN_010	16%	Up (1.2µg/L)
SW206	Side-gradient Location	MORELL_040	21%	Down (<0.195µg /L)

Legend (trends)

Down	Downward trend	No Trend*	No discernible trend with No exceedances
No Trend	No discernible trend or not enough data points	Up	Upward trend

This table shows:

- Upstream - concentrations of PAHs in surface water were reported above the relevant GAC in between 0% (SW211) and 44% (Upstream PDM 1) of samples at locations upstream of the site. Average concentrations of PAH 16 at these locations varied between <0.195 µg/L (SW211, SW210) and 1.1 µg/L (Upstream PDM 1, minor exceedance), with upward trends noted at SW101, SW202 and Upstream PDM 1.

- At Licence Pt A and Licence Pt E - Total PAH 16 were detected above the relevant GAC in 71% and 52% of samples at Licence Pt A and Licence Pt E, respectively. The average concentration of PAH 16 recorded over the period considered was 1.1 µg/L (Licence Pt A, minor exceedance) and 0.58 µg/L (Licence Pt E, minor exceedance), with an upward trend observed at Licence Pt A and a downward trend observed at Licence Pt E.

- Downstream - Total PAH 16 were detected above the relevant GAC in between 20% (SW213) and 89% (Final Exit) of samples at locations downstream of the site. Average concentrations of PAH 16 at these locations varied between 0.21 µg/L (SW212, marginal exceedance) and 1.6 µg/L (Final Exit, minor exceedance), with an upward trend noted at Final Exit and a downward trend observed at SW207. All other downstream locations did not show a statistically significant trend. It is noted that the number of data points for SW2012 and SW213 was insufficient for an adequate trend analysis.

- Side-gradient locations - Total PAH 16 were detected above the relevant GAC in 16% (SW204) and 21% (SW206) of samples at side-gradient locations. The average concentration of PAH 16 recorded over the period considered was 1.2 µg/L and <0.195 µg/L at SW204 (minor exceedance) and SW206 respectively. An upward trend was observed at SW204 and a downward trend observed at SW206. It is noted, however, that the trend analysis and the average concentration measured at SW204 are affected by an unusually elevated value recorded during June 2016. Further monitoring would be required to confirm if the spike recorded represents an outlier or if it is evidence of the upward trend observed for locations upstream of the site (SW101 and SW202).

11. ECOLOGICAL ASSESSMENTS

Two (2) kick sampling surveys were conducted at locations around the site in February 2015 and May 2015. Detailed reports of the ecological surveys are provided in Appendix A and summarised in the table below.

Location	*Description*	*SSRS Score (chronological)*	*Status*	*Q-Value (chronological)*
SW203	Location upstream of the site	3.2 and 1.6	At Risk	Q3 and Q3
SW202	Location upstream of the site	2.4 and 4	At Risk	Q3 and Q3
SW204	Location side gradient of the site	2.4 and 5.6	At Risk	Q3 and Q3-4
SW207	Location downstream of the site	2.4 and 2.4	At Risk	Q3 and Q3

The results of the assessment show that the status of surface water bodies both upstream and downstream of the site is generally "At Risk", with recorded Q-values of Q3. This indicates that no significant adverse effect is caused by site activities to the ecological status and quality of the surface water system.

12. EXTENT OF SEDIMENT AFFECTED BY PAHS AND POTENTIAL OFFSITE SOURCES

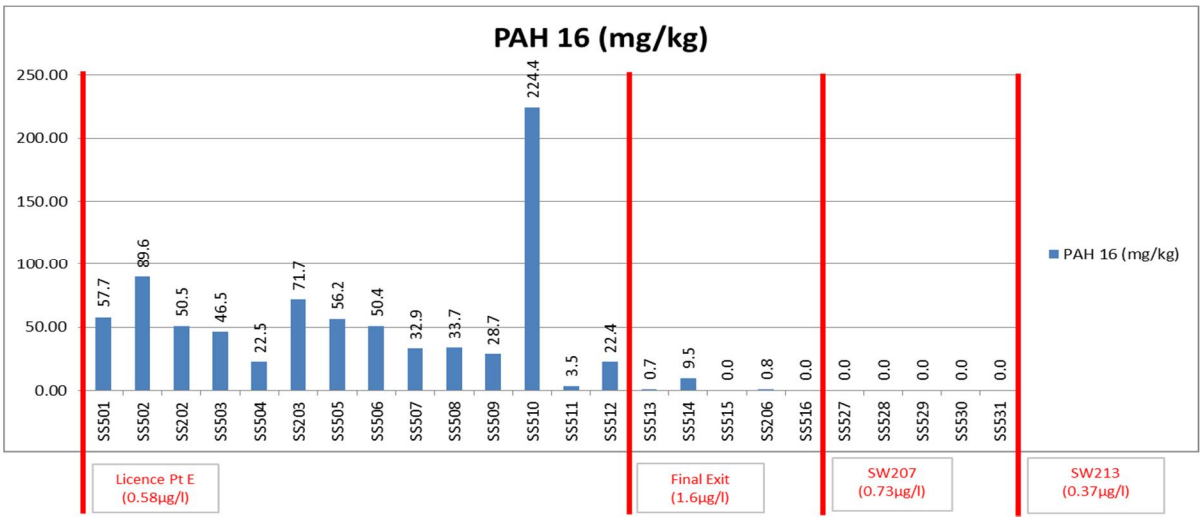
The sections below describe the extent of sediment containing elevated PAHs for each of the stream sections understood to be connecting the site with the Painestown River. Historical sediment data (SS200s series) was also included in this assessment.

12.1 Licence Pt E to Painestown River

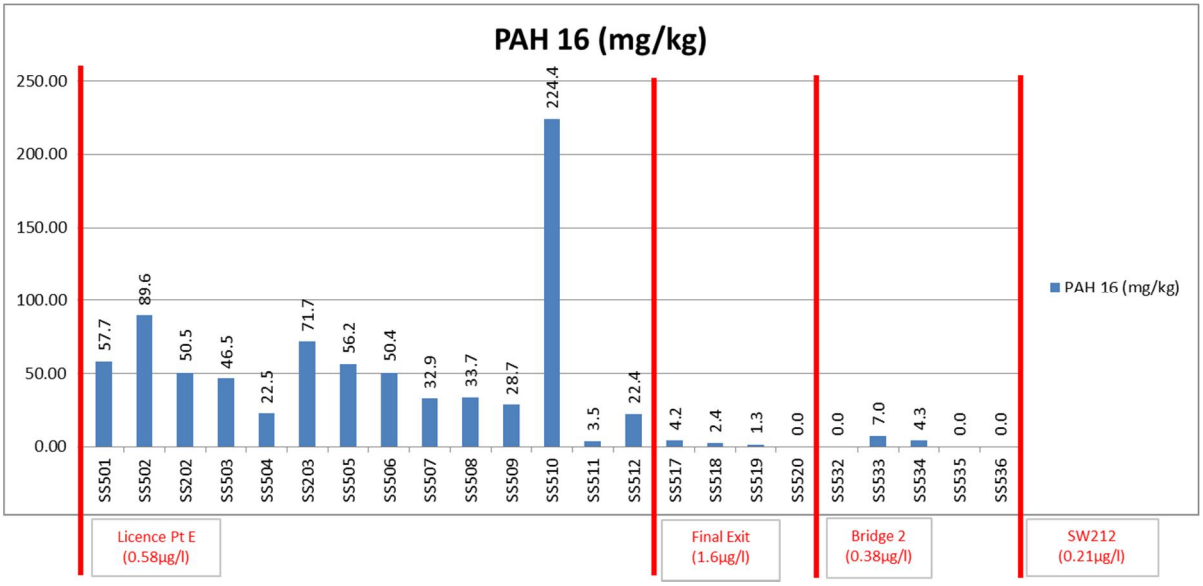
The two bar graphs (Graph 1 and Graph 2) below illustrate the distribution of PAH concentrations (mg/kg) in the sediments from Licence Pt E along the alternate surface water pathways to the two most downgradient surface water monitoring locations, SW213 and SW212.

For illustrative purposes, the average surface water concentrations (µg/l) of PAH 16 recorded at surface water monitoring locations from September 2014 to date are also reported on the graph. It is noted that, at some of the surface water locations, monitoring data is not available for the full period, since these were included in the monitoring programme in more recent times.

Graph 1 - Licence Pt E to SW213



Graph 2 - Licence Pt E to SW212



As evident from both graphs, the highest concentrations of PAH 16 are recorded in the section between Licence Pt E and Final Exit. Along this section, four local maximums are noted, at SS502 (89.6 mg/kg), SS203 (71.7 mg/kg), SS510 (224.4 mg/kg) and SS512 (22.4 mg/kg), with a declining trend in sediment concentrations noted after each maximum. SS510 also represents the absolute maximum sediment concentration by some margin.

Potential sources of PAHs along this section of drainage ditch include:

- Discharges from Licence Pt E;
- Discharges from third party yard adjacent to this drain, which is used for the storage of creosote treated timber poles;
- Historic overland flow from the PDM site directly into the drains; and
- Historic discharges from Licence Pt D (into the drainage system on the neighbouring site), which were discontinued after July 2015 following works on site to convey waters from Licence Pt D to the WwTP.

The pattern seen in the graphs above is considered to be consistent with the presence of several point source discharge points (such as a drain outfalls), potentially leading to the observed spikes in sediment PAH concentrations.

Generally, the concentration of PAH 16 in sediments is seen to reduce significantly downgradient of Final Exit (values below 9.5 mg/kg).

- on the surface water pathway to SW213, PAH 16 were found to be below detection between SW207 and SW213;
- whereas, on the surface water pathway to SW212, between Bridge 2 and SW2012, PAHs were detected at two of four sediment sampling locations, SS533 (7.0 mg/kg) and SS534 (4.3mg/kg).

It is noted, however, that SS533 and SS534 are located immediately downgradient of a section of stream running adjacent a road, where road run-off is a possible source of PAHs.

The distribution of PAH 16 in the sediment samples collected is consistent with the average concentrations of PAH 16 observed in surface water. The average PAH 16 recorded at Licence Pt E (0.58 µg/l) is lower than the concentration measured at Final Exit (1.6 µg/l), indicating the presence of off-site PAH inputs such as those listed above.

Moving downstream of Final Exit, the average PAH 16 concentrations in surface water consistently decrease with average concentrations recorded at Bridge 2 (0.38 µg/l), SW212 (0.21 µg/l) and

SW213 (0.37 µg/L) being close to the analytical detection limit of 0.195 µg/L and are generally lower than the average concentrations recorded in surface water immediately upstream of the site: at SW202 (0.24 µg/l), UPSTREAM PDM1 (1.1 µg/L) and SW101 (1.1 µg/L).

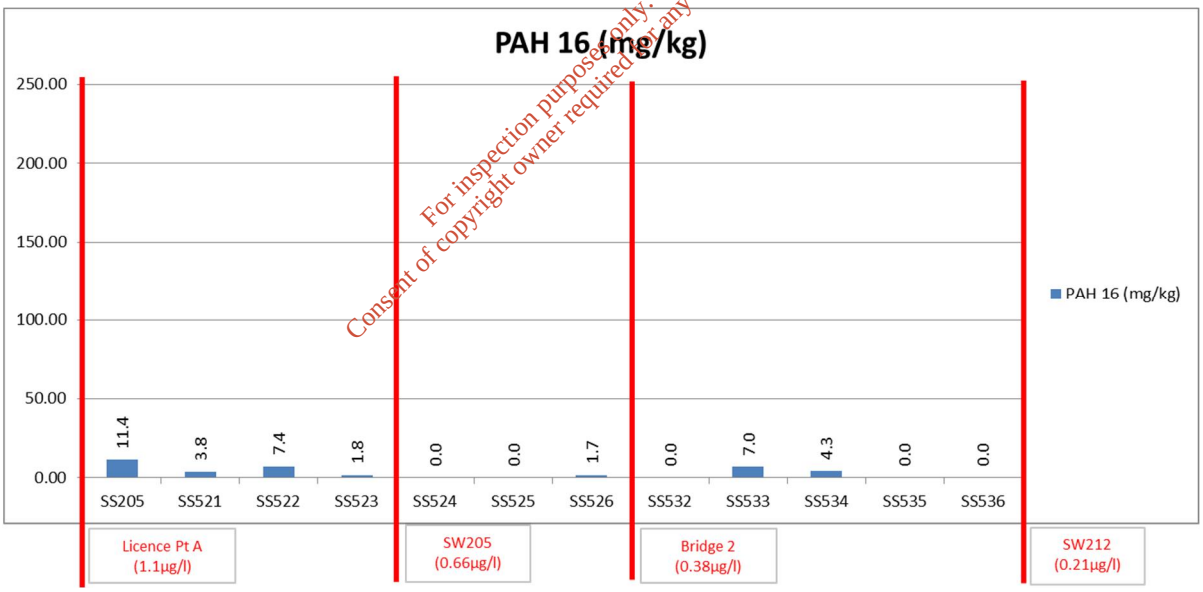
12.2 Licence Pt A to Painestown River

Graph 3 below illustrates the distribution of PAH concentrations (mg/kg) in the sediments between Licence Pt A and the most downgradient surface monitoring location SW213. For illustrative purposes, the average surface water concentrations (µg/l) of PAH 16 recorded at surface water monitoring locations from 2014 to date is also reported on the graph.

As shown on the graph, the highest (albeit relatively low) concentrations of PAH 16 are recorded in the section between Licence Pt A and SW205. In this section, the highest concentration recorded is 11.4 mg/kg at SS205 (2014 data) approximately 350 m downstream of Licence Pt A. It is noted that the stream is culverted immediately after Licence Pt A. It would be reasonable to assume that little settlement would occur in this section and that sediment deposition would be mostly occurring where the drain re-surfaces, a short distance upgradient of SS205.

Low concentrations are noted locally between SW205 and Bridge 2 at SS523 (1.8 mg/kg) and SS526 (1.7 mg/kg). However, due to the nature of the drain and its proximity to the road, it is likely that road runoff might be contributing to the concentrations reported as suggested by the intermittent detections recorded. As previously discussed, road runoff is considered to be a potential source of the PAH 16 detected at SS533 and SS534.

Graph 3 – Licence Pt A to SW212



The distribution of PAH 16 in the sediment samples collected is generally consistent with the average concentrations of PAH 16 observed in surface water. It is noted that the average PAH 16 consistently decrease from Licence Pt A (1.1 µg/l) to SW212 (0.21 µg/l) and that the further downgradient averages are lower that reported surface water PAH 16 concentrations in surface water samples immediately upstream of the site.

12.3 Farmer's Pond

Two (2) samples were collected from the sediments within the Farmer's Pond, adjacent to the western site boundary (upgradient). Farmers Pond Sed 1 and Farmers Pond Sed 2 showed PAH 16 concentrations of 1.5 mg/kg and 10.3 mg/kg respectively. The source of sediments impacted by PAH 16 is deemed to be a historical discharge from a land drain installed to drain an area of the site

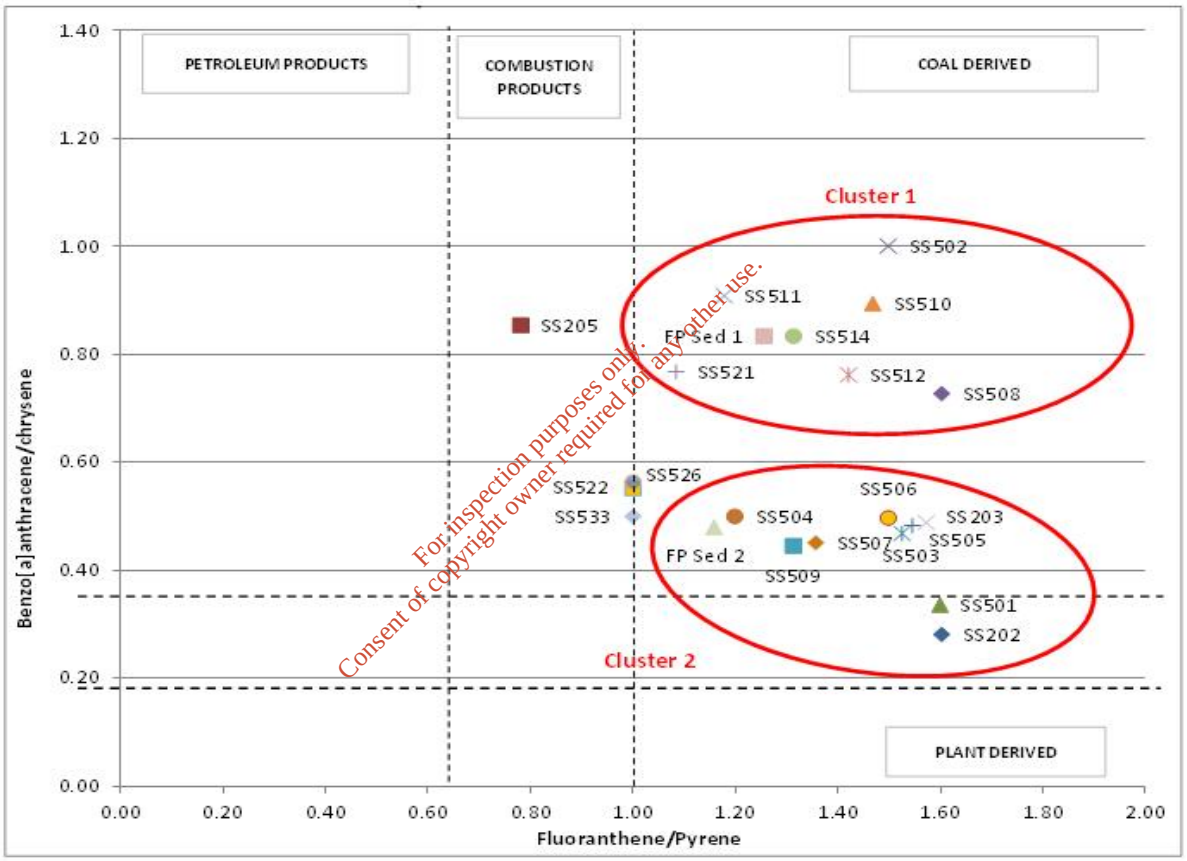
immediately west of the Farmer's Pond (anecdotal). This drain is reported to have been blocked/decommissioned by PDM several years ago.

PAHs are also detected in surface water samples from the Farmer's Pond, with average recorded concentrations of PAH 16 of 0.78 µg/L. The pond is deemed to be spring fed as inferred from the absence of influent flow and the presence of water even during extended dry spells. Therefore the likely source of PAHs in the water is deemed to be the contaminated sediments within the pond.

12.4 Double Ratio PAH Plots

Double ratio PAH plots for the sediment samples considered are presented in Graph 4 below. It was not possible to plot all samples on the chart, as some samples did not contain all of the PAHs necessary to calculate the ratios at detectable concentrations.

Graph 4 - Double Ratio PAH Plot



From Graph 4, two main clusters are interpreted (Cluster 1 and Cluster 2). Both clusters show a typical signature of coal-derived products. While most of the samples collected between Licence Pt E and Final Exit are contained within Cluster 2, the data does not allow for a clear interpretation. The scatter observed is considered to be the result of degradation processes over the 48 years of site operations. It is noted that potential on-site and off-site PAH sources along this section of the surface water system are both associated with creosote-treated timber and therefore a clear distinction between these sources is unlikely to be identified.

It is noted that the further downstream sediment samples SS205, SS522, SS526 and SS533 fall close to or within the "Combustion Products" category; with the latter three tightly clustered. This potentially indicates that the source of PAHs is likely from road run-off at these locations which are all located at or downstream of where the watercourses run close to minor roads.

13. CONCLUSIONS

Overall, the findings of the assessment reported herein indicate that PAH impacts in sediment and surface water do not extend far beyond the site boundary and that site activities and residual contamination would appear to have no significant adverse effect on the ecological status and quality further downstream on the local surface water system. In addition, the potential risk to identified receptors (including livestock) is considered to be **low** or **negligible**.

These conclusions are discussed further as follows:

Potential Sources of PAHs

- Contaminated sediments between Licence Pt E and Final Exit likely originated from on-site sources, as well as off-site source (including the neighboring third party treated pole storage yard).
- PAH double ratio plots where generally inconclusive upstream of Final Exit due to the significant weathering of PAHs that has occurred over time and the similar composition of potential sources. However, further downstream these provide a further line of evidence potentially linking downstream hot-spots with road run-off (combustion products signature).

Extent of PAH contamination in Sediments

- Contaminated sediments are generally localised to the 200 m stretch of open drain between the outlet of the culvert downstream of Licence Pt A and SW205, and to the 550 m stretch of open drain between Licence Pt E and Final Exit.
- Very localised hot-spots of PAH contaminated sediments (low level contamination) are found further downstream, in close proximity to roads and generally displaying a combustion products signature in double ration plots, which is distinct from the signature of PAH detections close to the site.

Livestock Risk Assessment

- None of the surface water parameters considered exceeded the relevant GAC. It is therefore considered that the risks posed by PAHs in surface water used as a watering source for livestock are **negligible**.
- The risk posed by contaminated sediments in the surface water system downstream of the site is considered to be **low-to-negligible** due to the localised nature of GAC exceedances (between Licence Pt E and Final Exit), the inherent conservativism in the GACs and the limited access that livestock would have to this section of the surface water system.
- The risk posed by mildly contaminated sediments at the Farmer's Pond is considered to be **negligible**.

Surface Waters Risk Assessment

Overall, the potential risk posed by PAH concentrations in surface water discharged from the site to the downstream surface water system (the Painestown River, in particular) is deemed to be **low** from Licence Pt E discharges and **low-to-moderate** from Licence Pt A discharges in consideration of the following:

- PAHs in surface water are reported at concentrations exceeding the GAC upstream of the site, indicating the presence of an off-site source of PAHs upstream of the site. It is noted that some upstream locations show an increasing trend in reported Total PAH 16 concentrations;
- Average Total PAH 16 concentrations furthest downstream of the site (SW212 and SW213) return to values close to or below reported background concentrations (reported at surface water sampling points SW101, SW202, SW210, SW211 and Upstream PDM 1);
- Total PAH 16 concentrations downstream of the site (SW212 and SW213) are below the relevant GAC in 70% of the samples collected at these locations. It is noted that SW213 is

located downstream of the site on the PAINSTOWN_10 WFD waterbody and that the selected GAC was exceeded (minor exceedance) on one occasion (80% compliance);

- While the Total PAH 16 concentrations recorded at Licence Pt A exceed the relevant GAC 71% of the time, concentrations reduce rapidly along the flow path to an average of 0.38 µg/L at Bridge 2 (entry point in to the PAINSTOWN_10 WFD waterbody), where the GAC is exceeded 38% of the time. It is noted, however, that an increasing trend is observed at Licence Pt A (but further attenuation measures are planned for this location;
- Interpretation of the PAH data indicates that other sources of PAHs (such as run-off from roadways) may be present in the catchment, both upstream and downstream of the site. It is noted that PAH double ratio plots for sediment samples SS205, SS522, SS526 and SS533 would suggest the presence of combustion products typically associated with road run-off.

Ecological Surveys

- Site activities and residual contamination would appear to have no significant adverse effect on the ecological status and quality of the surface water system.

14. RECOMMENDATIONS

The following is recommended in response to potential risks identified from elevated PAH concentrations reported in sediment and surface water downstream of the site. It is noted that several of these actions are currently being implemented, as detailed in Outline Corrective Action Plans already issued to the EPA[3,4].

Licence Pt A Catchment:

- Remove hot-spot soil contamination from the Rejected Pole Storage area (planned);
- Manage stocks so that treated timber is not stored in the catchment area (currently implemented);
- Construction of a SuDS solution, including an attenuation pond feature, to reduce up-take of PAHs and mildly contaminated soil particles by storm waters (planned);
- Clean-up of the Farmer's Pond and diversion of flow from the Farmer's Pond along the eastern boundary of the site (planned).

Licence Pt E Catchment:

- Upgrade/refurbish the existing WwTP to achieve fully compliant discharges (planned);
- Upgrade/refurbish of the existing drainage infrastructure to limit overland flow in to the surface water system either directly or indirectly through neighboring site (planned);
- Remove hot-spot soil contamination from Drainage Ditch 4 (planned);
- Re-surfacing and landscaping of yards to reduce up-take of PAHs and mildly contaminated soil particles by storm waters (planned).

Licence Pt E to Final Exit

- As a preemptive measure, liaise with local farmer so that livestock is prevented from accessing this section of the drain for watering purposes. It is noted that this would, in any case, be considered best agricultural practice as per EPA and SWAN guidance[5,6].

[5] EPA (2009) *Protection of water resources and habitat quality from impacts due to livestock access to water*

[6] SWAN (2015) *Sustainable Water Network – Agriculture and Water Management*

- Remove, at an appropriate time of the year (dry weather), any residual contaminated sediment from this section of the drain to prevent re-mobilisation of contaminants.
- Repeat the sediment sampling exercise two years after having removed the residual contaminated sediment.

Surface Water Monitoring

- Continue the current surface water monitoring programme to monitor trends in water quality of discharges and nearby water bodies, which will allow the effectiveness of the additional planned actions outlined above to be assessed.

FIGURES

CLIENT

SAINT GOBAIN T/A PDM

PROJECT

PDM - ADDITIONAL OFFSITE SEDIMENT
& SURFACE WATER RISK ASSESSMENT

DRAWING TITLE

FIGURE 1 - SITE LOCATION PLAN

AECOM

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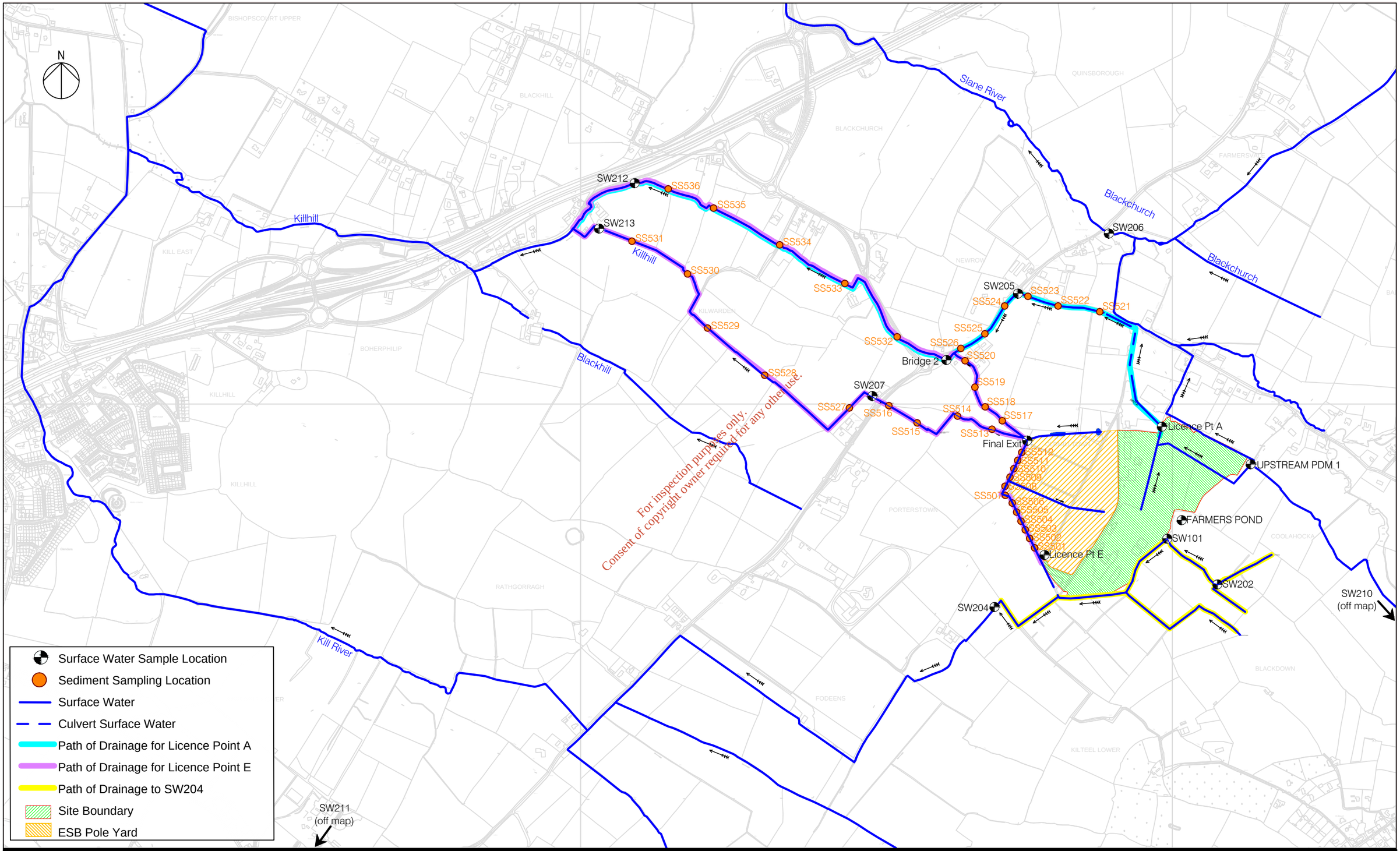
DRAWN	ILLUSTRATED	CHECKED	APPROVED	DATE
SML		MV	DM	12/08/16

SCALE	Job No.	REV.
1:50,000	60492969	1



Plot Date : 12 August 2016 16:22:02
File Name : \\SWUK\PROPOSALS\DUBLIN-PROPOSALS\SAINT GOBAIN BUILDING DISTRIBUTION\0000000 GENERAL CLIENT INFORMATION\TECHNICAL\PDM ADDITIONAL OFFSITE IMPACT ASSESSMENT\REPORT\FIGURES\FIGURE2_60485738 12.08.16 REV1

Project Title: PDM - ADDITIONAL OFFSITE SEDIMENT & SURFACE WATER RISK ASSESSMENT	Drawing Title: FIGURE 2 _ SEDIMENTS SAMPLE LOCATIONS	Purpose of issue: DRAFT				
Client: SAINT GOBAIN T/A PDM		Designed: PDM	Drawn: SML	Checked: MV	Approved: DM	Date: 12.08.16
		AECOM Internal Project No.: 60492969		Suitability: ILLUSTRATION		
		Scale @ A3: Scale		Zone / Mileage: N/A		

Drawing Number: Figure 2
Rev: 1

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AECOM

TABLES

Table 1
Analytical Results
Sedimant Samples Screening
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock (horse)	GAC Surface Water (calculated)	Location	SS202	SS203	SS205	SS206	SS501	SS502		SS503	SS504	SS505	SS506	SS507	SS508
					Average Depth (m)					0.7	0.7		0.6	0.09	0.6	0.4	0.4	0.25
					Date	04/12/2014	04/12/2014	04/12/2014	04/12/2014	09/06/2016	09/06/2016		09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-14-14908-1	JEL-14-14908-1	JEL-14-14908-1	JEL-14-14908-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1
PAH																		
Naphthalene	mg/kg	0.04		**0.00267**[#3]		**0.94**	**1.78**	<0.4	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Acenaphthylene	mg/kg	0.03				5.94	4.97	0.77	0.09	4.41	5.69	4.39	3.64	2.25	6.14	4.86	3.04	3.63
Acenaphthene	mg/kg	0.05				1.09	3.04	0.65	<0.05	1.19	3.92	4.46	1.64	0.9	2.09	3.49	1.41	0.94
Fluorene	mg/kg	0.04				1.16	2.59	<0.4	<0.04	1.49	4.1	4.52	2.11	1.3	2.27	3.26	1.36	1.35
Phenanthrene	mg/kg	0.03				2.9	6.67	0.75	0.11	5.86	4.79	6.41	4.07	2.3	3.87	4.86	2.55	2.16
Anthracene	mg/kg	0.04		**0.00113**[#3]		**9.27**	**9.41**	**0.48**	**0.14**	**9.66**	**12.81**	**9.3**	**6.87**	**3.85**	**10.14**	**9.1**	**5.22**	**6.77**
Fluoranthene	mg/kg	0.03		**0.00023**[#3]		**13.25**	**15.86**	**0.71**	**0.25**	**14.34**	**12.68**	**10.77**	**13.63**	**4.8**	**14.8**	**9.96**	**8.48**	**7.91**
Pyrene	mg/kg	0.03				8.26	10.08	0.91	0.2	8.97	8.45	6.57	8.93	4	9.58	6.64	6.25	4.93
Benz(a)anthracene	mg/kg	0.06				0.65	1.56	1.06	<0.06	0.77	2.07	1.06	0.74	0.4	0.98	0.74	0.54	0.77
Chrysene	mg/kg	0.02				2.32	3.19	1.24	0.05	2.3	7.2	2.6	1.58	0.8	2.03	1.49	1.2	1.06
Benzo(a) pyrene	mg/kg	0.04		**0.0000438**[#3]		**0.94**	**2.67**	**0.83**	<0.04	**1.46**	**5.39**	**2.79**	**0.58**	**0.35**	**0.74**	**1.14**	**0.49**	**0.82**
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		**0.65**	**1.33**	**0.74**	<0.04	**1.26**	**3.19**	**2.05**	**0.58**	**0.35**	**0.68**	**0.86**	**0.49**	**0.69**
Dibenz(a,h)anthracene	mg/kg	0.04				<0.04	<0.04	0.61	<0.04	0.27	0.6	0.42	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(g,h,i)perylene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		**0.65**	**1.63**	**0.83**	<0.04	**1.15**	**2.98**	**1.86**	**0.53**	**0.3**	**0.74**	**0.97**	**0.43**	**0.61**
Benzo(b)fluoranthene	mg/kg	0.05		**0.0000438**[#3 B(a)P]		**1.77**	**4.96**	**1.32**	<0.05	**3.25**	**11.33**	**4.73**	**1.18**	**0.65**	**1.55**	**2.18**	**1.02**	**1.47**
Benzo(k)fluoranthene	mg/kg	0.02		**0.0000438**[#3 B(a)P]		**0.69**	**1.93**	**0.51**	<0.02	**1.27**	**4.41**	**1.84**	**0.46**	**0.25**	**0.6**	**0.85**	**0.39**	**0.57**
LMW PAHs (sum)	mg/kg		106[#1]			21.3	28.46	2.65	0.34	22.61	31.31	29.08	18.33	10.6	24.51	25.57	13.58	14.85
HMW PAHs (sum)	mg/kg		21.2[#1]			29.18	43.21	8.76	0.5	35.04	58.3	34.69	28.21	11.9	31.7	24.83	19.29	18.83
PAH 16 Total	mg/kg	0.6		**Cannot back calculate.**[#4]		50.5	71.7	11.4	0.8	57.7	89.6	63.8	46.5	22.5	56.2	50.4	32.9	33.7

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (Horse)
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
Field_D: Field Duplicate

Key
XXX Exceedance of GAC Livestock (horse)
XXX Exceedance of GAC Surface Water (calculated)

Table 1
Analytical Results
Sedimant Samples Screening
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock (horse)	GAC Surface Water (calculated)	Location	SS509	SS510	SS511	SS512	SS513	SS514	SS515	SS516	SS517	SS518	SS519	SS520	SS521
					Average Depth (m)	0.19	0.18	0.56	0.6	0.03	0.11	0.01	1	0.1	0.19	0.202	0.025	0.1
					Date	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10244-1
PAH																		
Naphthalene	mg/kg	0.04		**0.00267**[#3]		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Acenaphthylene	mg/kg	0.03				3.31	1.46	0.48	1.93	0.09	0.85	<0.03	<0.03	0.41	0.33	0.2	<0.03	0.23
Acenaphthene	mg/kg	0.05				1.08	5.26	<0.05	0.64	<0.05	0.31	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg	0.04				1.39	9.76	0.13	0.87	<0.04	0.39	<0.04	<0.04	0.2	0.13	<0.04	<0.04	<0.04
Phenanthrene	mg/kg	0.03				2.05	23.96	0.22	1.65	0.04	0.77	<0.03	<0.03	0.41	0.23	0.14	<0.03	0.16
Anthracene	mg/kg	0.04		**0.00113**[#3]		**5.91**	**21.62**	**0.83**	**3.17**	**0.17**	**1.62**	<0.04	<0.04	**0.81**	**0.63**	**0.38**	<0.04	**0.49**
Fluoranthene	mg/kg	0.03		**0.00023**[#3]		**6.09**	**74.45**	**0.53**	**5.74**	**0.2**	**1.97**	**0.05**	**0.03**	**1.17**	**0.46**	**0.27**	**0.04**	**0.51**
Pyrene	mg/kg	0.03				4.64	50.67	0.45	4.04	0.16	1.5	0.04	<0.03	0.91	0.46	0.24	<0.03	0.47
Benz(a)anthracene	mg/kg	0.06				0.48	10.81	0.1	0.73	<0.06	0.35	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.23
Chrysene	mg/kg	0.02				1.08	12.1	0.11	0.96	0.04	0.42	<0.02	<0.02	0.25	0.13	0.1	<0.02	0.3
Benzo(a) pyrene	mg/kg	0.04		**0.0000438**[#3]		**0.48**	**3.57**	**0.1**	**0.51**	<0.04	**0.15**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.26**
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		**0.48**	**1.12**	**0.14**	**0.51**	<0.04	**0.35**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.28**
Dibenz(a,h)anthracene	mg/kg	0.04				<0.04	0.32	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(g,h,i)perylene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		**0.42**	**0.95**	**0.11**	**0.37**	<0.04	**0.27**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.35**
Benzo(b)fluoranthene	mg/kg	0.05		**0.0000438**[#3 B(a)P]		**0.91**	**6.01**	**0.19**	**0.93**	<0.05	**0.39**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**0.39**
Benzo(k)fluoranthene	mg/kg	0.02		**0.0000438**[#3 B(a)P]		**0.36**	**2.34**	**0.07**	**0.36**	<0.02	**0.15**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.15**
LMW PAHs (sum)	mg/kg		106[#1]			13.74	62.06	1.66	8.26	0.3	3.94	0	0	1.83	1.32	0.72	0	0.88
HMW PAHs (sum)	mg/kg		21.2[#1]			14.94	162.34	1.8	14.15	0.4	5.55	0.09	0.03	2.33	1.05	0.61	0.04	2.94
PAH 16 Total	mg/kg	0.6		**Cannot back calculate.**[#4]		28.7	224.4	3.5	22.4	0.7	9.5	<0.6	<0.6	4.2	2.4	1.3	<0.6	3.8

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (Horse)
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GAC: Generic Assessment Criteria
(blank): No assessment criteria available
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Key
XXX Exceedance of GAC Livestock (horse)
XXX Exceedance of GAC Surface Water (calculated)

Table 1
Analytical Results
Sedimant Samples Screening
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock (horse)	GAC Surface Water (calculated)	Location	SS522	SS523	SS524	SS525	SS526	SS527	SS528	SS529	SS530	SS531	SS532	SS533	SS534
					Average Depth (m)	0.15	0.12	0.04	0.04	0.1	0.015	1.5	3	0.05	0.015	0.03	0.0175	0.03
					Date	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	08/06/2016	08/06/2016	08/06/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10244-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1	JEL-16-10100-1
PAH																		
Naphthalene	mg/kg	0.04		**0.00267**[#3]		<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Acenaphthylene	mg/kg	0.03				0.72	0.16	<0.03	<0.03	0.08	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	0.62	0.33
Acenaphthene	mg/kg	0.05				0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg	0.04				0.22	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.17	<0.04
Phenanthrene	mg/kg	0.03				0.32	0.12	<0.03	<0.03	0.11	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	0.37	0.29
Anthracene	mg/kg	0.04		**0.00113**[#3]		**1.31**	**0.32**	**0.07**	**0.05**	**0.14**	<0.04	<0.04	**0.11**	<0.04	<0.04	<0.04	**0.87**	**0.61**
Fluoranthene	mg/kg	0.03		**0.00023**[#3]		**1.24**	**0.32**	**0.05**	**0.03**	**0.3**	**0.04**	<0.03	**0.15**	<0.03	<0.03	<0.03	**1.2**	**0.82**
Pyrene	mg/kg	0.03				1.24	0.3	0.05	0.05	0.3	<0.03	<0.03	0.11	<0.03	<0.03	0.04	1.2	0.82
Benz(a)anthracene	mg/kg	0.06				0.22	<0.06	<0.06	<0.06	0.09	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.25	<0.06
Chrysene	mg/kg	0.02				0.4	0.12	0.03	0.02	0.16	<0.02	<0.02	0.03	<0.02	<0.02	0.02	0.5	0.33
Benzo(a) pyrene	mg/kg	0.04		**0.0000438**[#3]		**0.25**	**0.08**	<0.04	<0.04	**0.12**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.37**	**0.2**
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		**0.32**	**0.1**	<0.04	<0.04	**0.09**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.33**	**0.16**
Dibenz(a,h)anthracene	mg/kg	0.04				<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzo(g,h,i)perylene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		**0.32**	**0.1**	<0.04	<0.04	**0.11**	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	**0.29**	**0.2**
Benzo(b)fluoranthene	mg/kg	0.05		**0.0000438**[#3 B(a)P]		**0.46**	**0.16**	<0.05	<0.05	**0.17**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**0.57**	**0.38**
Benzo(k)fluoranthene	mg/kg	0.02		**0.0000438**[#3 B(a)P]		**0.18**	**0.06**	<0.02	<0.02	**0.06**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.22**	**0.15**
LMW PAHs (sum)	mg/kg		106[#1]			2.72	0.6	0.07	0.05	0.33	0	0	0.25	0	0	0	2.03	1.23
HMW PAHs (sum)	mg/kg		21.2[#1]			4.63	1.24	0.13	0.1	1.4	0.04	0	0.29	0	0	0.06	4.93	3.06
PAH 16 Total	mg/kg	0.6		**Cannot back calculate.**[#4]		7.4	1.8	<0.6	<0.6	1.7	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	7	4.3

Comments
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GAC: Generic Assessment Criteria
(blank): No assessment criteria available
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Key
XXX Exceedance of GAC Livestock (horse)
XXX Exceedance of GAC Surface Water (calculated)

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Analytical Results
Sedimant Samples Screening
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock (horse)	GAC Surface Water (calculated)	Location	SS535	SS536	Farmers Pond Sed 1	Farmers Pond Sed 2
					Average Depth (m)	0.0175	0.35		
					Date	08/06/2016	08/06/2016	04/04/2016	04/04/2016
					Sample Type	Normal	Normal	Normal	Normal
					SDG	JEL-16-10100-1	JEL-16-10100-1	JEL-16-7191-1	JEL-16-7191-1
PAH									
Naphthalene	mg/kg	0.04		**0.00267**[#3]		<0.04	<0.04	<0.04	<0.04
Acenaphthylene	mg/kg	0.03				<0.03	<0.03	0.08	0.9
Acenaphthene	mg/kg	0.05				<0.05	<0.05	<0.05	0.13
Fluorene	mg/kg	0.04				<0.04	<0.04	<0.04	0.21
Phenanthrene	mg/kg	0.03				<0.03	<0.03	0.1	0.51
Anthracene	mg/kg	0.04		**0.00113**[#3]		<0.04	**0.09**	**0.15**	**1.63**
Fluoranthene	mg/kg	0.03		**0.00023**[#3]		**0.07**	**0.18**	**0.39**	**2.72**
Pyrene	mg/kg	0.03				0.07	0.15	0.31	2.35
Benz(a)anthracene	mg/kg	0.06				<0.06	<0.06	0.15	0.22
Chrysene	mg/kg	0.02				0.04	0.09	0.18	0.46
Benzo(a) pyrene	mg/kg	0.04		**0.0000438**[#3]		<0.04	<0.04	<0.04	**0.19**
Indeno(1,2,3-c,d)pyrene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		<0.04	<0.04	<0.04	**0.21**
Dibenz(a,h)anthracene	mg/kg	0.04				<0.04	<0.04	<0.04	<0.04
Benzo(g,h,i)perylene	mg/kg	0.04		**0.0000438**[#3 B(a)P]		<0.04	<0.04	<0.04	**0.19**
Benzo(b)fluoranthene	mg/kg	0.05		**0.0000438**[#3 B(a)P]		<0.05	<0.05	**0.13**	**0.4**
Benzo(k)fluoranthene	mg/kg	0.02		**0.0000438**[#3 B(a)P]		<0.02	<0.02	**0.05**	**0.15**
LMW PAHs (sum)	mg/kg		106[#1]			0	0.09	0.33	3.38
HMW PAHs (sum)	mg/kg		21.2[#1]			0.18	0.42	1.21	6.89
PAH 16 Total	mg/kg	0.6		**Cannot back calculate.**[#4]		<0.6	<0.6	1.5	10.3

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (Horse)
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
Field_D: Field Duplicate

Key
XXX Exceedance of GAC Livestock (horse)
XXX Exceedance of GAC Surface Water (calculated)

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location	Bridge 2																Farmers Pond	
					Well	-																	
					Date	22/10/2014	11/11/2014	05/12/2014	04/02/2015	04/03/2015	25/03/2015	24/04/2015	19/08/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	07/10/2014	14/10/2014
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-14-12828-1	JEL-14-13777-1	JEL-14-14908-1	JEL-15-3255-1	JEL-15-4439-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-11712-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1		
PAH																							
Naphthalene	µg/L	0.01		**130**[#2]		<0.014	0.03	<0.01	0.07	0.11	<0.014	<0.014	<0.014	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.619	0
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.04	0.2	<0.013	<0.013	<0.013	<0.013	0.06	0.168	0
Acenaphthene	µg/L	0.01				<0.013	0.04	0.01	0.06	0.15	0.08	0.02	0.04	<0.013	<0.013	0.03	<0.013	<0.013	0.03	<0.013	0.22	0.847	0.034
Fluorene	µg/L	0.01				<0.014	<0.014	<0.01	<0.014	0.06	0.03	<0.014	0.03	<0.014	<0.014	0.04	<0.014	<0.014	0.03	<0.014	0.1	0.37	0.0169
Phenanthrene	µg/L	0.01				<0.011	<0.011	0.01	<0.011	0.16	0.06	<0.011	0.03	<0.011	<0.011	0.07	<0.011	0.04	0.06	<0.011	0.05	0.192	0
Anthracene	µg/L	0.01		**0.1**[#2]		0.02	0.04	0.02	0.02	0.05	0.03	<0.013	0.02	0.03	0.09	**0.37**	<0.013	0.02	0.02	0.03	**0.12**	0.0402	0
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	0.07	0.01	0.02	0.09	0.1	<0.012	0.03	0.02	0.08	**0.53**	0.02	0.06	0.04	0.03	**0.31**	0.0806	0.0536
Pyrene	µg/L	0.01				<0.013	0.05	0.01	0.02	0.06	0.06	<0.013	<0.013	0.02	0.08	0.48	0.02	0.03	0.02	0.02	0.19	0.0447	0.0354
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.01	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.06	<0.015	<0.015	<0.015	<0.015	0.02	0	0
Chrysene	µg/L	0.01				<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.02	0.13	<0.011	<0.011	<0.011	<0.011	0.03	0	0
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.01	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.02	0.08	<0.016	<0.016	<0.016	<0.016	<0.016	0	0
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	**0.05**	<0.011	<0.011	<0.011	<0.011	<0.011	0	0
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0	0
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	**0.05**	<0.011	<0.011	<0.011	<0.011	<0.011	0	0
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**0.1**	<0.01	<0.01	<0.01	<0.01	**0.02**	0	0
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	**0.04**	<0.01	<0.01	<0.01	<0.01	<0.01	0	0
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0	0.11	0.04	0.15	0.53	0.2	0.02	0.12	0.03	0.13	0.71	0	0.06	0.14	0.03	0.55	2.2362	0.0509
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0.12	0.02	0.04	0.15	0.16	0	0.03	0.04	0.28	1.52	0.04	0.09	0.06	0.05	0.57	0.1253	0.089
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	**0.23**	<0.1	<0.195	**0.68**	**0.36**	<0.195	<0.195	<0.195	**0.41**	**2.23**	<0.195	<0.195	0.2	<0.195	**1.13**	**2.3615**	0.1399

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (Calves)
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																			
Well																		-						
Date					21/10/2014	28/10/2014	04/11/2014	11/11/2014	19/11/2014	25/11/2014	02/12/2014	09/12/2014	16/12/2014	22/12/2014	06/01/2015		13/01/2015	04/02/2015	04/03/2015	25/03/2015	24/04/2015	28/05/2015	25/11/2015	21/12/2015
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SDG															JEL-15-2068-1			JEL-15-3255-1	JEL-15-4439-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-16995-1	JEL-15-18295-1
PAH																								
Naphthalene	µg/L	0.01		**130**[#2]	0.327	0	0.103	0	0	0	0	0	0	<0.1	<0.1	0.09	<0.1	0.27	0.07	0.3	0.02	<0.014	<0.1	0.3
Acenaphthylene	µg/L	0.01			0.0503	0.0596	0	0.0239	0	0	0	0	0	<0.011	<0.011	<0.013	<0.011	<0.013	<0.013	0.02	<0.013	0.02	0.02	0.02
Acenaphthene	µg/L	0.01			2.55	0.471	0.358	0.305	0	0.0717	0.0739	0	0.0405	<0.015	<0.015	0.21	<0.015	0.14	0.22	0.77	0.14	0.09	0.37	1.45
Fluorene	µg/L	0.01			0.926	0.273	0.145	0.087	0	0.0207	0.0165	0	0	<0.014	<0.014	0.06	<0.014	0.03	0.06	0.3	0.06	<0.014	0.12	0.46
Phenanthrene	µg/L	0.01			0.941	0.431	0.197	0.0304	0	0	0.0243	0.0556	0.0659	<0.022	<0.022	0.12	0.0317	0.03	0.1	0.29	0.05	<0.011	<0.011	0.27
Anthracene	µg/L	0.01		**0.1**[#2]	0.0227	0.0359	0	0	0	0	0	0	0	<0.015	<0.015	<0.013	<0.015	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]	**0.163**	**0.193**	0.101	0.038	0.0456	0	0.0904	0.101	**0.165**	0.0368	<0.017	**0.17**	0.0607	0.03	0.06	**0.13**	0.04	0.1	**0.2**	0.04
Pyrene	µg/L	0.01			0.0844	0.112	0.053	0.0243	0.0388	0	0.0618	0.0832	0.116	0.0458	<0.015	0.1	0.0461	0.02	0.04	0.06	0.03	0.08	0.12	0.02
Benz(a)anthracene	µg/L	0.01			0	0	0	0	0	0	0	0	0	<0.017	<0.017	<0.015	<0.017	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01			0	0	0	0	0	0	0	0.0148	0.0272	0.0193	<0.013	<0.011	0.0186	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]	0	0	0	0	0	0	0	0	0.0095	<0.009	<0.009	<0.016	<0.009	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]	0	0	0	0	0	0	0	0	0	<0.014	<0.014	<0.011	<0.014	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01			0	0	0	0	0	0	0	0	0	<0.016	<0.016	<0.01	<0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]	0	0	0	0	0	0	0	0	0	<0.016	<0.016	<0.011	<0.016	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]	0	0	0	0	0	0	0	0	**0.0329**	<0.023	<0.023	0.01	<0.023	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]	0	0	0	0	0	0	0	0	0	<0.027	<0.027	<0.01	<0.027	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]		4.817	1.2705	0.803	0.4463	0	0.0924	0.1147	0.0556	0.1064	0	0	0.48	0.0317	0.47	0.45	1.68	0.27	0.11	0.51	2.5
High Molecular Weight PAHs (Sum)	µg/L		402[#1]		0.2474	0.305	0.154	0.0623	0.0844	0	0.1522	0.199	0.3506	0.1019	0	0.28	0.1254	0.05	0.1	0.19	0.07	0.18	0.32	0.06
PAH 16 Total	µg/L	0.1		**0.2**[#4]	**5.0644**	**1.5755**	**0.957**	**0.5086**	0.0844	0.0924	**0.2669**	**0.2546**	**0.457**	0.1019	<0.1	**0.77**	0.1571	**0.52**	**0.55**	**1.87**	**0.34**	**0.29**	**0.83**	**2.56**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location	Farmers Pond Outlet															Final Exit	
					Well	-																
					Date	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	06/01/2016	13/01/2016	27/01/2016	04/02/2016	10/02/2016	17/02/2016	02/03/2016	14/06/2016	22/06/2016	15/09/2014	11/11/2014
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-16-3092-1	JEL-16-3395-1	JEL-16-4089-1	JEL-16-4528-1	JEL-16-4759-1	JEL-16-5080-1	JEL-16-5751-1	JEL-16-10326-1	JEL-16-10651-1	JEL-14-10593-1	JEL-14-13777-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.014	<0.014
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.04	<0.013	<0.013	<0.013	0.11	0.04	0.02	0.07
Acenaphthene	µg/L	0.01				0.24	0.14	0.26	0.14	0.06	0.17	<0.013	0.02	0.8	0.81	0.03	0.1	0.14	<0.013	0.92	0.05	<0.013
Fluorene	µg/L	0.01				0.1	0.02	0.11	0.06	0.03	0.04	<0.014	<0.014	0.22	0.11	<0.014	0.02	0.02	<0.014	0.43	0.03	<0.014
Phenanthrene	µg/L	0.01				0.06	<0.011	0.13	0.05	0.06	0.02	<0.011	<0.011	0.12	<0.011	<0.011	<0.011	<0.011	0.04	0.42	0.05	0.03
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.02	<0.013	**0.23**	0.03	**0.16**	**0.2**
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.03	0.02	**0.14**	0.03	0.12	0.09	<0.012	<0.012	0.02	0.05	<0.012	0.03	0.02	**0.33**	**0.25**	0.03	0.07
Pyrene	µg/L	0.01				<0.013	<0.013	0.06	0.02	0.04	0.06	<0.013	<0.013	<0.013	0.03	<0.013	0.03	0.02	0.32	0.1	0.03	0.05
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.03	<0.015	<0.015	0.02
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.07	<0.011	<0.011	0.03
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.02	<0.016	0.02	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.06**	<0.01	<0.01	0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.02**	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.4	0.16	0.6	0.25	0.15	0.23	0	0.02	1.34	0.96	0.03	0.14	0.16	0.38	2.14	0.31	0.3
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.03	0.02	0.2	0.05	0.16	0.15	0	0	0.02	0.08	0	0.06	0.04	0.89	0.35	0.08	0.18
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**0.43**	<0.195	**0.8**	**0.3**	**0.31**	**0.38**	<0.195	<0.195	**1.36**	**1.04**	<0.195	0.2	0.2	**1.27**	**2.49**	**0.39**	**0.49**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																	Licence Pt A
Well					-																	
Date					04/12/2014	22/12/2014	06/01/2015		13/01/2015	04/02/2015	04/03/2015	25/03/2015	24/04/2015	28/05/2015	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	03/02/2016
Sample Type					Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SDG					JEL-14-14908-1			JEL-15-2068-1		JEL-15-3255-1	JEL-15-4439-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-16-4441-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.01	<0.1	<0.1	<0.014	<0.1	0.48	<0.014	0.02	<0.014	<0.014	<0.1	<0.1	<0.1	<0.1	1.3	<0.1	<0.1	0.1
Acenaphthylene	µg/L	0.01				0.06	0.0208	0.0171	0.05	0.0286	0.06	0.06	0.03	0.04	0.04	0.15	0.44	0.03	0.03	0.06	0.06	0.13	0.04
Acenaphthene	µg/L	0.01				<0.01	0.0199	<0.015	<0.013	0.0166	0.34	0.05	0.1	0.08	0.05	0.14	0.22	0.02	0.02	0.75	0.11	0.03	1.15
Fluorene	µg/L	0.01				<0.01	<0.014	<0.014	<0.014	<0.014	0.09	0.04	0.05	0.02	<0.014	0.06	0.12	<0.014	0.05	0.41	0.02	0.04	0.25
Phenanthrene	µg/L	0.01				<0.01	<0.022	<0.022	<0.011	0.0259	0.05	0.07	0.05	<0.011	0.02	0.1	0.2	<0.011	0.21	0.24	0.03	0.11	0.03
Anthracene	µg/L	0.01		**0.1**[#2]		**0.18**	0.0593	0.0803	**0.14**	**0.168**	**0.13**	**0.17**	0.09	**0.12**	**0.14**	**0.35**	**0.87**	0.1	0.1	**0.15**	**0.15**	**0.34**	0.04
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.07	0.0456	0.0454	0.04	0.0875	**0.13**	0.1	0.06	0.03	0.06	**0.69**	**6.92**	0.04	**2.09**	0.09	0.06	**0.4**	0.12
Pyrene	µg/L	0.01				0.06	0.0389	0.0408	0.04	0.0733	0.09	0.06	0.05	0.02	0.04	0.45	3.93	0.03	0.83	0.04	0.03	0.4	0.07
Benz(a)anthracene	µg/L	0.01				0.02	<0.017	<0.017	0.02	<0.017	0.03	<0.015	<0.015	<0.015	<0.015	0.06	0.41	<0.015	<0.015	<0.015	<0.015	0.06	<0.015
Chrysene	µg/L	0.01				0.03	<0.013	<0.013	0.03	<0.013	0.05	<0.011	<0.011	<0.011	<0.011	0.09	0.5	<0.011	0.04	<0.011	<0.011	0.09	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		0.02	<0.009	<0.009	<0.016	<0.009	<0.016	<0.016	<0.016	<0.016	<0.016	0.03	0.09	<0.016	<0.016	<0.016	<0.016	0.02	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.01	<0.014	<0.014	<0.011	<0.014	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	**0.03**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.016	<0.016	<0.01	<0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.01	<0.016	<0.016	<0.011	<0.016	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	**0.02**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		0.01	<0.023	<0.023	0.01	<0.023	**0.02**	<0.01	<0.01	<0.01	<0.01	**0.05**	**0.2**	<0.01	<0.01	<0.01	<0.01	**0.03**	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.027	<0.027	<0.01	<0.027	<0.01	<0.01	<0.01	<0.01	<0.01	**0.02**	**0.08**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.24	0.1	0.0974	0.19	0.2391	1.15	0.39	0.34	0.26	0.25	0.8	1.85	0.15	0.41	2.91	0.37	0.65	1.61
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.21	0.0845	0.0862	0.14	0.1608	0.32	0.16	0.11	0.05	0.1	1.43	12.18	0.07	2.96	0.13	0.09	1.01	0.19
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**0.5**	0.1845	0.1836	**0.34**	**0.3999**	**1.48**	**0.55**	**0.45**	**0.31**	**0.35**	**2.23**	**14.03**	**0.22**	**3.37**	**3.04**	**0.46**	**1.66**	**1.8**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																				
					Well																				
					Date	15/09/2014	16/09/2014	23/09/2014	30/09/2014	07/10/2014	14/10/2014	21/10/2014	22/10/2014	28/10/2014	04/11/2014	11/11/2014		19/11/2014	25/11/2014	02/12/2014	04/12/2014	09/12/2014	16/12/2014	22/12/2014	30/12/2014	06/01/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	normal		Normal	normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-14-10593-1							JEL-14-12886-1				JEL-14-13777-1				JEL-14-14908-1					JEL-15-2068-1
PAH																										
Naphthalene	µg/L	0.01		**130**[#2]		<0.014	0	0	0	0	0	0	<0.014	0	0	0	<0.014	0	0	0	<0.01	0	0	<0.1	<0.1	<0.1	0.19
Acenaphthylene	µg/L	0.01				<0.013	0	0	0.013	0	0	0.0144	<0.013	0.117	0	0	0.03	0	0	0	<0.01	0.0158	0.0138	<0.011	<0.011	0.0173	0.08
Acenaphthene	µg/L	0.01				0.02	0	0.0539	0.0891	0.0271	0	0.0262	0.05	0.0671	0	0	0.02	0	0	0	0.02	0.0475	0.024	<0.015	<0.015	<0.015	0.1
Fluorene	µg/L	0.01				<0.014	0	0	0	0	0	0.0193	0.02	0.075	0	0	<0.014	0	0	0	<0.01	0.0151	0	<0.014	<0.014	<0.014	0.03
Phenanthrene	µg/L	0.01				0.04	0	0	0	0	0	0.0243	<0.011	0.22	0	0	<0.011	0	0	0	<0.01	0	0	<0.022	<0.022	<0.022	0.05
Anthracene	µg/L	0.01		**0.1**[#2]		0.07	**0.127**	0.0855	0.0608	0.0343	0.0542	**0.193**	0.06	**0.41**	0.0973	**0.104**	0.07	0.0685	0.0485	0.0309	0.04	0.0739	0.0226	0.0403	0.0175	0.0589	**0.17**
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.04	0	0	0	0.0463	0	0.0659	0.02	**2.05**	0	0.04	0.04	0.0179	0	0.0203	<0.01	0	0	<0.017	<0.017	0.0914	**0.22**
Pyrene	µg/L	0.01				0.03	0	0	0	0.0324	0	0.0581	<0.013	2.56	0	0.036	0.04	0.0155	0	0.017	<0.01	0	0	<0.015	<0.015	0.106	0.21
Benz(a)anthracene	µg/L	0.01				<0.015	0	0	0	0	0	0	<0.015	0.184	0	0	<0.015	0	0	0	<0.01	0	0	<0.017	<0.017	<0.017	0.03
Chrysene	µg/L	0.01				<0.011	0	0	0	0	0	0	<0.011	0.271	0	0	<0.011	0	0	0	<0.01	0	0	<0.013	<0.013	<0.013	0.05
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	0	0	0	0	0	0	<0.016	0.0969	0	0	<0.016	0	0	0	<0.01	0	0	<0.009	<0.009	0.0121	0.02
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	0	0	0	0	0	0	<0.011	**0.154**	0	0	<0.011	0	0	0	<0.01	0	0	<0.014	<0.014	<0.014	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	0	0	0	0	0	0	<0.01	0.0282	0	0	<0.01	0	0	0	<0.01	0	0	<0.016	<0.016	<0.016	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	0	0	0	0	0	0	<0.011	**0.144**	0	0	<0.011	0	0	0	<0.01	0	0	<0.016	<0.016	**0.0194**	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	0	0	0	0	0	0	<0.01	**0.25**	0	0	0.01	0	0	0	<0.01	0	0	<0.023	<0.023	**0.0314**	**0.04**
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	0	0	0	0	0	0	<0.01	**0.0749**	0	0	<0.01	0	0	0	<0.01	0	0	<0.027	<0.027	<0.027	0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.13	0.127	0.1394	0.1629	0.0614	0.0542	0.2772	0.13	0.8891	0.0973	0.104	0.12	0.0685	0.0485	0.0309	0.06	0.1523	0.0604	0.0403	0.0175	0.0762	0.62
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.07	0	0	0	0.0787	0	0.124	0.02	5.813	0	0.077	0.09	0.0334	0	0.0373	0	0	0	0	0	0.2603	0.58
PAH 16 Total	µg/L	0.1		**0.2**[#4]		0.2	0.127	0.1394	0.1629	0.1401	0.0542	**0.4012**	<0.195	**6.7021**	0.0973	0.181	**0.22**	0.1019	0.0485	0.0682	<0.1	0.1523	0.0604	0.0403	0.0175	**0.3365**	**1.2**

Comments

#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key

XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																		
Well																							
Date					13/01/2015		21/01/2015	29/01/2015	04/02/2015		10/02/2015	18/02/2015	04/03/2015	11/03/2015	18/03/2015	25/03/2015		01/04/2015	08/04/2015	15/04/2015	22/04/2015	24/04/2015	29/04/2015
Sample Type					Normal		Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal
SDG						JEL-15-2338-1	JEL-15-2651-1	JEL-15-3089-1	150205-74	JEL-15-3255-1	JEL-15-3475-1	JEL-15-3819-1	JEL-15-4439-1	JEL-15-4747-1	JEL-15-5061-1	JEL-15-5373-1	JEL-15-5375-1	JEL-15-5650-1	JEL-15-5862-1	JEL-15-6176-1	JEL-15-6471-1	JEL-15-6689-1	JEL-15-6770-1
PAH																							
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.014	0.15	<0.014	<0.1	0.51	<0.014	<0.014	<0.014	0.06	<0.014	0.05	-	<0.014	0.06	0.08	0.43	<0.014	<0.014
Acenaphthylene	µg/L	0.01				<0.011	0.02	0.03	0.09	<0.011	0.02	0.02	0.02	<0.013	0.03	0.02	0.02	-	0.02	0.02	0.02	<0.013	0.02	0.03
Acenaphthene	µg/L	0.01				<0.015	0.12	<0.013	0.04	0.0272	0.1	0.09	0.08	0.06	0.28	<0.013	0.31	-	0.02	0.11	0.03	0.47	0.18	0.12
Fluorene	µg/L	0.01				<0.014	0.03	<0.014	0.02	<0.014	0.02	<0.014	0.02	<0.014	0.07	<0.014	0.09	-	<0.014	0.04	<0.014	0.16	0.04	0.03
Phenanthrene	µg/L	0.01				<0.022	<0.011	<0.011	0.03	<0.022	0.02	<0.011	0.02	0.04	0.05	<0.011	0.05	-	<0.011	0.05	<0.011	0.45	0.02	0.03
Anthracene	µg/L	0.01		**0.1**[#2]		0.0439	0.05	0.05	**0.16**	0.0225	0.04	0.04	0.04	0.06	0.04	0.04	0.05	-	0.06	0.06	0.05	0.05	0.04	0.09
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.017	0.03	0.03	**0.2**	0.0213	0.03	0.03	0.04	0.04	0.09	0.02	0.03	-	0.02	0.04	0.02	0.05	<0.012	0.07
Pyrene	µg/L	0.01				<0.015	0.03	0.04	0.2	0.0215	0.03	0.03	0.04	0.04	0.06	0.02	0.02	-	0.02	0.03	0.02	0.03	<0.013	0.05
Benz(a)anthracene	µg/L	0.01				<0.017	<0.015	<0.015	0.02	<0.017	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	-	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.013	<0.011	<0.011	0.04	<0.013	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	-	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.009	<0.016	<0.016	0.02	<0.009	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	-	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.014	<0.011	<0.011	<0.011	<0.014	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	-	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.016	<0.01	<0.01	<0.01	<0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.016	<0.011	<0.011	<0.011	<0.016	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	-	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.023	<0.01	<0.01	**0.04**	<0.023	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.027	<0.01	<0.01	0.01	<0.027	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.0439	0.22	0.23	0.34	0.0497	0.71	0.15	0.18	0.16	0.53	0.06	0.57	0	0.1	0.34	0.18	1.56	0.3	0.3
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0.06	0.07	0.53	0.0428	0.06	0.06	0.08	0.08	0.15	0.04	0.05	0	0.04	0.07	0.04	0.08	0	0.12
PAH 16 Total	µg/L	0.1		**0.2**[#4]		0.0439	**0.28**	**0.3**	**0.87**	<0.344	**0.77**	**0.21**	**0.26**	**0.24**	**0.68**	<0.195	**0.62**	-	<0.195	**0.41**	**0.22**	**1.64**	**0.3**	**0.42**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
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GAC: Generic Assessment Criteria
(blank): No assessment criteria available
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Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																	
					Well	-																
					Date	06/05/2015	12/05/2015	20/05/2015	28/05/2015	03/06/2015	10/06/2015	25/06/2015	08/07/2015	19/08/2015	27/08/2015	23/09/2015	28/10/2015	11/11/2015	18/11/2015	25/11/2015		02/12/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		Normal
					SDG	JEL-15-7035-1	JEL-15-7232-1	JEL-15-7611-1	JEL-15-8038-1	JEL-15-8216-1	JEL-15-8575-1	JEL-15-9339-1	JEL-15-9820-1	JEL-15-11712-1	JEL-15-12065-1	JEL-15-13757-1	JEL-15-15435-1	JEL-15-16165-1	JEL-15-16537-1	JEL-15-16995-1	JEL-15-17000-1	JEL-15-17278-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.014	<0.014	0.33	<0.014	<0.014	<0.014	0.3	<0.014	<0.014	<0.014	<0.014	<0.1	<0.1	0.1	-	<0.1	0.1
Acenaphthylene	µg/L	0.01				0.15	0.02	0.1	0.06	<0.013	0.05	0.04	0.12	0.03	0.07	0.05	0.18	0.18	0.31	-	0.08	0.07
Acenaphthene	µg/L	0.01				0.12	0.16	2.7	1.74	<0.013	0.25	1.78	1.07	0.48	0.06	0.12	0.7	0.09	0.05	-	0.02	0.08
Fluorene	µg/L	0.01				0.03	0.06	1.01	0.38	<0.014	0.14	0.64	0.48	0.11	0.02	0.02	0.27	0.03	0.05	-	0.02	0.02
Phenanthrene	µg/L	0.01				0.08	0.04	0.32	<0.011	<0.011	0.07	0.24	0.26	0.02	0.04	<0.011	0.16	0.06	0.1	-	0.04	0.02
Anthracene	µg/L	0.01		**0.1**[#2]		**0.34**	0.05	**0.14**	0.04	0.07	0.06	0.03	0.06	0.03	**0.25**	**0.14**	**0.32**	**0.36**	**0.59**	-	**0.18**	**0.11**
Fluoranthene	µg/L	0.01		**0.12**[#2]		**0.48**	0.05	**0.52**	**0.14**	0.06	**0.17**	0.06	0.12	0.07	**0.19**	**0.36**	**0.99**	**0.48**	**0.71**	-	**0.14**	0.08
Pyrene	µg/L	0.01				0.55	0.03	0.23	0.06	0.07	0.05	0.02	0.05	0.03	0.14	0.31	0.75	0.47	0.68	-	0.13	0.07
Benz(a)anthracene	µg/L	0.01				0.04	<0.015	0.03	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.04	0.04	0.07	-	0.02	<0.015
Chrysene	µg/L	0.01				0.11	<0.011	0.03	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.04	<0.011	0.07	0.09	0.15	-	0.04	0.02
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		0.05	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.03	<0.016	0.03	0.05	0.04	-	0.02	0.02
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		**0.05**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	<0.011	**0.02**	**0.04**	**0.04**	-	<0.011	**0.02**
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		**0.04**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	**0.03**	<0.011	<0.011	**0.03**	**0.03**	-	<0.011	**0.02**
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		**0.1**	<0.01	**0.02**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.04**	<0.01	**0.04**	**0.09**	**0.12**	-	**0.04**	**0.03**
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		**0.04**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.02**	<0.01	**0.02**	**0.03**	**0.04**	-	0.01	0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.72	0.33	4.6	2.22	0.07	0.57	3.03	1.99	0.67	0.44	0.33	1.63	0.72	1.2	0	0.34	0.4
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			1.46	0.08	0.83	0.2	0.13	0.22	0.08	0.17	0.1	0.51	0.67	1.96	1.32	1.88	0	0.4	0.27
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**2.18**	**0.41**	**5.44**	**2.42**	0.2	**0.79**	**3.11**	**2.16**	**0.77**	**0.95**	**1**	**3.59**	**2.04**	**3.08**	-	**0.74**	**0.67**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																
					Well																
					Date	09/12/2015	16/12/2015	22/12/2015	30/12/2015	06/01/2016	13/01/2016	20/01/2016	27/01/2016	10/02/2016	17/02/2016	24/02/2016	02/03/2016	09/03/2016	06/04/2016	13/04/2016	11/05/2016	25/05/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-15-17652-1	JEL-15-18022-1	JEL-15-18294-1	JEL-15-18386-1	JEL-16-3092-1	JEL-16-3395-1	JEL-16-3720-1	JEL-16-4089-1	JEL-16-4759-1	JEL-16-5080-1	JEL-16-5413-1	JEL-16-5751-1	JEL-16-6084-1	JEL-16-7268-1	JEL-16-7592-1	JEL-16-8789-1	JEL-16-9421-1
PAH																					
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	0.1	0.3	<0.1	1.5	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01				0.38	0.11	0.06	0.03	0.02	0.03	<0.013	0.17	0.03	0.02	0.02	0.1	0.04	0.07	0.02	0.04	0.02
Acenaphthene	µg/L	0.01				0.2	1.38	<0.013	0.76	0.21	1.37	0.14	0.64	0.35	0.03	0.52	0.17	0.05	3.05	0.05	0.03	0.04
Fluorene	µg/L	0.01				0.06	0.26	<0.014	0.27	0.07	0.34	0.03	0.13	0.05	<0.014	0.12	0.12	<0.014	0.99	0.03	0.02	0.02
Phenanthrene	µg/L	0.01				0.11	0.03	0.03	0.12	0.04	0.17	0.02	0.05	<0.011	<0.011	0.05	0.35	<0.011	0.6	0.06	0.03	0.03
Anthracene	µg/L	0.01		**0.1**[#2]		**0.61**	**0.16**	0.09	0.05	0.04	0.02	0.02	**0.29**	0.04	0.03	0.02	**0.21**	0.09	0.07	0.06	**0.13**	0.1
Fluoranthene	µg/L	0.01		**0.12**[#2]		**1.05**	**0.39**	0.1	**0.4**	0.08	0.09	0.04	**1.19**	**0.13**	0.09	0.06	**0.37**	0.03	**0.32**	0.09	**0.25**	0.11
Pyrene	µg/L	0.01				1	0.24	0.06	0.21	0.05	0.05	0.03	0.9	0.09	0.08	0.03	0.31	0.02	0.18	0.08	0.19	0.1
Benz(a)anthracene	µg/L	0.01				0.1	0.02	0.02	<0.015	<0.015	<0.015	<0.015	0.06	<0.015	<0.015	<0.015	0.05	<0.015	0.02	0.03	0.02	<0.015
Chrysene	µg/L	0.01				0.22	0.03	0.03	0.02	<0.011	<0.011	<0.011	0.1	<0.011	<0.011	<0.011	0.08	<0.011	0.02	0.03	0.03	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		0.17	0.02	0.02	<0.016	<0.016	<0.016	<0.016	0.04	<0.016	<0.016	<0.016	0.04	<0.016	<0.016	<0.016	0.02	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		**0.09**	**0.02**	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	<0.011	<0.011	<0.011	**0.05**	<0.011	<0.011	<0.011	**0.02**	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		**0.07**	**0.02**	<0.011	<0.011	<0.011	<0.011	<0.011	**0.02**	<0.011	<0.011	<0.011	**0.03**	<0.011	<0.011	<0.011	**0.02**	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		**0.23**	**0.04**	**0.02**	0.01	<0.01	<0.01	<0.01	**0.07**	<0.01	0.01	<0.01	**0.09**	<0.01	<0.01	**0.02**	**0.03**	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		**0.09**	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	<0.01	<0.01	<0.01	**0.03**	<0.01	<0.01	<0.01	0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			1.36	1.94	0.18	1.23	0.38	2.33	0.21	1.28	0.47	0.08	0.83	1.25	0.18	6.28	0.22	0.25	0.21
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			3.04	0.79	0.25	0.64	0.13	0.14	0.07	2.43	0.22	0.18	0.09	1.05	0.05	0.54	0.25	0.59	0.21
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**4.4**	**2.73**	**0.44**	**1.88**	**0.51**	**2.47**	**0.28**	**3.71**	**0.69**	**0.27**	**0.92**	**2.3**	**0.23**	**6.82**	**0.48**	**0.84**	**0.42**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
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#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
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GAC: Generic Assessment Criteria
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Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location				Licence Pt E																	
					Well																					
					Date	14/06/2016	22/06/2016	29/06/2016	03/02/2016	30/03/2016	15/09/2014	07/10/2014	14/10/2014	21/10/2014	22/10/2014	28/10/2014	04/11/2014	11/11/2014		19/11/2014	25/11/2014	02/12/2014	04/12/2014	09/12/2014	16/12/2014
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	normal	Normal		normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-10326-1	JEL-16-10651-1	JEL-16-11007-1	JEL-16-4441-1	JEL-16-7019-1	JEL-14-10593-1				JEL-14-12828-1			JEL-14-13777-1					JEL-14-14908-1		
PAH																										
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	-	<0.1	<0.1	<0.1	0.27	0	0	0.182	0.03	0	0	0	<0.014	0	0	0	<0.01	0.236	0
Acenaphthylene	µg/L	0.01				0.03	-	0.52	0.02	<0.013	0.17	0.0186	0.0251	0	<0.013	0	0.0231	0.071	0.12	0.0596	0.0345	0.0709	0.36	0.0609	0.0703
Acenaphthene	µg/L	0.01				0.16	-	0.19	<0.013	<0.013	0.85	0	0.0227	0.0214	<0.013	0	0	0.023	<0.013	0.0329	0.0154	0.0344	0.04	0.343	0.0314
Fluorene	µg/L	0.01				0.05	-	0.15	<0.014	<0.014	0.43	0	0	0.0457	<0.014	0	0	0.024	0.02	0.0392	0.0164	0.0406	0.04	0.038	0.0388
Phenanthrene	µg/L	0.01				0.06	-	0.21	<0.011	<0.011	0.33	0	0	0.127	<0.011	0	0	0.054	0.02	0.051	0.027	0.0801	0.07	0.162	0.0817
Anthracene	µg/L	0.01		**0.1**[#2]		**0.13**	-	**1.01**	0.04	<0.013	**0.41**	0.0483	0.0493	0.0357	0.02	0.0298	0.0846	**0.21**	**0.19**	**0.152**	0.0813	**0.124**	**0.54**	0.0842	**0.117**
Fluoranthene	µg/L	0.01		**0.12**[#2]		**0.24**	-	**1.59**	0.04	0.02	**0.18**	0.0229	0.047	0.0694	<0.012	0.0171	0.0716	**0.234**	0.08	**0.189**	0.117	**0.289**	**0.44**	**0.233**	**0.431**
Pyrene	µg/L	0.01				0.22	-	1.68	0.04	0.03	0.09	0.0626	0.0401	0.0436	<0.013	0	0.0538	0.37	0.12	0.405	0.153	0.341	0.4	0.252	0.509
Benz(a)anthracene	µg/L	0.01				<0.015	-	0.2	<0.015	<0.015	<0.015	0	0	0	<0.015	0	0	0.124	0.07	0.154	0.036	0.132	0.26	0	0.0934
Chrysene	µg/L	0.01				0.02	-	0.35	0.02	<0.011	0.02	0	0	0	<0.011	0	0	0.039	0.06	0.0803	0.0261	0.0525	0.33	0.0273	0.0587
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	-	0.23	<0.016	<0.016	0.02	0	0	0	<0.016	0	0	0.053	0.04	0.0306	0.0206	0.0613	0.11	0.0348	0.0674
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	-	**0.25**	<0.011	<0.011	<0.011	0	0	0	<0.011	0	0	**0.021**	<0.011	0	**0.0159**	**0.0266**	**0.02**	**0.0173**	**0.0265**
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	-	<0.01	<0.01	<0.01	<0.01	0	0	0	<0.01	0	0	0	<0.01	0	0	0	<0.01	0	0
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	-	**0.13**	<0.011	<0.011	<0.011	0	0	0	<0.011	0	0	**0.025**	<0.011	**0.0172**	0	**0.0293**	**0.02**	**0.0165**	**0.0305**
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		0.01	-	**0.43**	<0.01	<0.01	0.01	0	0	0	<0.01	0	0	**0.113**	**0.05**	**0.066**	**0.0473**	**0.128**	**0.15**	**0.0812**	**0.158**
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	-	**0.17**	<0.01	<0.01	<0.01	0	0	0	<0.01	0	0	**0.038**	**0.02**	0	0	**0.041**	**0.06**	0	**0.0473**
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.43	0	2.08	0.06	0	2.46	0.0669	0.0971	0.4118	0.05	0.0298	0.1077	0.382	0.35	0.3347	0.1746	0.35	1.05	0.9241	0.3392
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.49	0	5.03	0.1	0.05	0.32	0.0855	0.0871	0.113	0	0.0171	0.1254	1.016	0.44	0.9421	0.4159	1.1007	1.79	0.6621	1.4218
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**0.93**	-	**7.11**	<0.195	<0.195	**2.79**	0.1524	0.1842	**0.5248**	<0.195	0.0469	**0.2331**	**1.398**	**0.79**	**1.2768**	**0.5905**	**1.4507**	**2.8**	**1.5862**	**1.761**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
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GAC: Generic Assessment Criteria
(blank): No assessment criteria available
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Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																		
					Well																		
					Date	22/12/2014	30/12/2014	06/01/2015		13/01/2015		21/01/2015	04/02/2015		18/02/2015	25/02/2015	04/03/2015	11/03/2015	18/03/2015	25/03/2015		01/04/2015	08/04/2015	15/04/2015
					Sample Type	Normal	Normal	Normal		Normal		Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal		Normal	Normal	Normal
					SDG				JEL-15-2068-1		JEL-15-2338-1	JEL-15-2651-1	150205-74	JEL-15-3255-1	JEL-15-3819-1	JEL-15-4118-1	JEL-15-4439-1	JEL-15-4747-1	JEL-15-5061-1	JEL-15-5373-1	JEL-15-5375-1	JEL-15-5650-1	JEL-15-5862-1	JEL-15-6176-1
PAH																							
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	0.12	<0.1	0.4	<0.014	0.256	0.2	<0.014	<0.014	<0.014	<0.014	<0.014	0.04	-	<0.014	<0.014	0.08
Acenaphthylene	µg/L	0.01				0.0595	0.031	0.031	0.14	0.0299	0.14	0.12	0.04	0.15	0.06	0.07	<0.013	0.04	0.02	<0.013	-	0.02	<0.013	<0.013
Acenaphthene	µg/L	0.01				0.026	<0.015	<0.015	0.04	<0.015	0.08	0.03	0.0459	0.06	0.02	0.02	<0.013	0.03	0.03	<0.013	-	<0.013	0.03	<0.013
Fluorene	µg/L	0.01				0.0325	0.0173	0.0152	0.11	<0.014	0.11	0.04	0.0357	0.02	<0.014	<0.014	<0.014	<0.014	0.02	<0.014	-	<0.014	<0.014	<0.014
Phenanthrene	µg/L	0.01				0.0788	0.0365	0.0348	0.12	0.0266	0.15	0.04	0.0552	0.05	0.03	0.02	<0.011	0.02	<0.011	<0.011	-	<0.011	0.02	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		**0.115**	0.0555	0.0611	**0.24**	0.0522	**0.2**	**0.2**	0.0797	**0.25**	**0.11**	**0.12**	<0.013	0.06	0.03	0.02	-	0.04	0.02	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		**0.281**	0.101	0.113	**0.27**	0.0995	**0.21**	**0.23**	**0.332**	**0.43**	**0.13**	**0.2**	<0.012	0.07	0.03	0.02	-	0.02	0.03	<0.012
Pyrene	µg/L	0.01				0.359	0.13	0.187	0.29	0.16	0.22	0.26	0.479	0.43	0.1	0.15	<0.013	0.05	0.02	0.02	-	0.02	0.02	<0.013
Benz(a)anthracene	µg/L	0.01				0.0693	<0.017	<0.017	0.11	0.0221	0.09	0.08	0.151	0.14	0.04	0.04	<0.015	<0.015	<0.015	<0.015	-	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				0.0437	<0.013	<0.013	0.15	<0.013	0.09	0.11	0.0882	0.17	0.05	0.06	<0.011	<0.011	<0.011	<0.011	-	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		0.0488	0.0331	0.0267	0.05	0.029	0.04	0.04	0.0556	0.05	0.03	0.03	<0.016	<0.016	<0.016	<0.016	-	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		**0.0176**	<0.014	<0.014	<0.011	<0.014	<0.011	<0.011	**0.0218**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	-	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.016	<0.016	<0.016	<0.01	<0.016	<0.01	<0.01	<0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		**0.0232**	<0.016	<0.016	<0.011	<0.016	<0.011	<0.011	**0.0227**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	-	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		**0.113**	**0.0683**	**0.0666**	**0.07**	**0.0539**	**0.04**	**0.06**	**0.131**	**0.09**	**0.04**	**0.04**	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		**0.0363**	<0.027	<0.027	**0.03**	<0.027	**0.02**	**0.02**	**0.0407**	**0.03**	**0.02**	**0.02**	<0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.3118	0.1403	0.1421	0.77	0.1087	1.08	0.43	0.5125	0.73	0.22	0.23	0	0.15	0.1	0.06	0	0.06	0.07	0.08
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.9919	0.3324	0.3933	0.97	0.3645	0.71	0.8	1.322	1.34	0.41	0.54	0	0.12	0.05	0.04	0	0.04	0.05	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**1.3037**	**0.4727**	**0.5354**	**1.74**	**0.4732**	**1.79**	**1.23**	**1.83**	**2.07**	**0.63**	**0.77**	<0.195	**0.27**	<0.195	<0.195	-	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																
					Well													-			
					Date	29/04/2015	06/05/2015	12/05/2015	20/05/2015	03/06/2015	08/07/2015	23/07/2015	05/08/2015	27/08/2015	02/09/2015	09/09/2015	16/09/2015	23/09/2015	07/10/2015	21/10/2015	28/10/2015	18/11/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-15-6770-1	JEL-15-7035-1	JEL-15-7232-1	JEL-15-7611-1	JEL-15-8216-1	JEL-15-9820-1	JEL-15-10600-1	JEL-15-11027-1	JEL-15-12065-1	JEL-15-12286-1	JEL-15-12578-1	JEL-15-12892-1	JEL-15-13757-1	JEL-15-14429-1	JEL-15-15095-1	JEL-15-15435-1	JEL-15-16537-1
PAH																					
Naphthalene	µg/L	0.01		**130**[#2]		<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.1	0.2	<0.1	0.1
Acenaphthylene	µg/L	0.01				<0.013	0.02	<0.013	<0.013	0.02	<0.013	<0.013	<0.013	0.02	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.02
Acenaphthene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.02	<0.013	<0.013	<0.013	0.02	<0.013
Fluorene	µg/L	0.01				<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Phenanthrene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		0.02	0.06	0.02	<0.013	0.02	0.02	<0.013 - 0.02	<0.013	0.04	<0.013	<0.013	<0.013	0.02	<0.013	<0.013	0.02	0.04
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	0.04	0.02	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	0.02	0.02
Pyrene	µg/L	0.01				<0.013	0.04	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.03
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.02	0.08	0.02	0	0.04	0.02	0	0	0.06	0	0	0.02	0.02	0	0.2	0.04	0.16
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0.08	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.05
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	0.2	<0.195	**0.21**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																
Well																					
Date					25/11/2015	02/12/2015	09/12/2015	16/12/2015	22/12/2015	30/12/2015	06/01/2016	13/01/2016	20/01/2016	27/01/2016	04/02/2016	05/02/2016	09/02/2016	10/02/2016	11/02/2016	12/02/2016
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SDG					JEL-15-16995-1	JEL-15-17000-1	JEL-15-17278-1	JEL-15-17652-1	JEL-15-18022-1	JEL-15-18294-1	JEL-15-18386-1	JEL-16-3092-1	JEL-16-3395-1	JEL-16-3720-1	JEL-16-4089-1	JEL-16-4528-1	JEL-16-4582-1	JEL-16-4706-1	JEL-16-4759-1	JEL-16-4844-1	JEL-16-4914-1
PAH																					
Naphthalene	µg/L	0.01		**130**[#2]	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01			-	0.02	0.06	0.13	0.1	0.48	0.07	0.05	0.04	0.03	0.02	0.03	0.03	0.03	0.04	0.03	0.07
Acenaphthene	µg/L	0.01			-	<0.013	<0.013	0.02	0.02	0.28	<0.013	0.02	<0.013	0.03	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.02
Fluorene	µg/L	0.01			-	<0.014	0.02	0.02	0.03	0.08	0.02	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.02
Phenanthrene	µg/L	0.01			-	<0.011	0.04	0.05	0.05	0.1	0.03	0.02	0.02	<0.011	<0.011	0.02	<0.011	<0.011	0.02	0.02	0.03
Anthracene	µg/L	0.01		**0.1**[#2]	-	0.03	0.08	**0.18**	**0.15**	**0.82**	0.1	0.09	0.07	0.04	0.04	0.07	0.05	0.06	0.09	0.05	0.1
Fluoranthene	µg/L	0.01		**0.12**[#2]	-	0.04	0.08	**0.22**	**0.23**	**1.29**	0.12	0.07	0.07	0.05	0.03	0.07	0.04	0.05	0.12	0.07	0.09
Pyrene	µg/L	0.01			-	0.04	0.08	0.18	0.16	1.05	0.08	0.05	0.05	0.03	0.02	0.05	0.03	0.03	0.07	0.04	0.06
Benz(a)anthracene	µg/L	0.01			-	<0.015	0.02	0.06	0.03	0.11	0.03	0.02	0.02	<0.015	<0.015	<0.015	<0.015	<0.015	0.04	<0.015	0.02
Chrysene	µg/L	0.01			-	0.02	0.02	0.09	0.06	0.23	0.04	0.03	0.03	0.02	<0.011	0.02	<0.011	0.02	0.05	0.02	0.02
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]	-	<0.016	<0.016	0.03	0.02	0.17	0.02	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.03	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]	-	<0.011	<0.011	<0.011	<0.011	**0.22**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01			-	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]	-	<0.011	<0.011	**0.02**	<0.011	**0.19**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]	-	<0.01	0.01	**0.05**	**0.03**	**0.28**	**0.03**	**0.02**	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.06**	0.01	**0.02**
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]	-	<0.01	<0.01	**0.02**	0.01	**0.11**	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.02**	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]		0	0.05	0.2	0.4	0.35	1.76	0.22	0.18	0.13	0.1	0.06	0.12	0.08	0.09	0.15	0.1	0.24
High Molecular Weight PAHs (Sum)	µg/L		402[#1]		0	0.1	0.21	0.67	0.54	3.7	0.33	0.19	0.18	0.1	0.05	0.14	0.07	0.1	0.39	0.14	0.21
PAH 16 Total	µg/L	0.1		**0.2**[#4]	-	<0.195	**0.42**	**1.07**	**0.89**	**5.46**	**0.55**	**0.38**	**0.32**	0.2	<0.195	**0.26**	<0.195	<0.195	**0.54**	**0.25**	**0.46**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																	
Well																						
Date					16/02/2016	17/02/2016	18/02/2016	19/02/2016	23/02/2016	24/02/2016	25/02/2016	26/02/2016	02/03/2016	09/03/2016	16/03/2016	06/04/2016	13/04/2016	20/04/2016	04/05/2016	25/05/2016	01/06/2016	14/06/2016
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SDG					JEL-16-5029-1	JEL-16-5080-1	JEL-16-5156-1	JEL-16-5238-1	JEL-16-5360-1	JEL-16-5413-1	JEL-16-5471-1	JEL-16-5574-1	JEL-16-5751-1	JEL-16-6084-1	JEL-16-6402-1	JEL-16-7268-1	JEL-16-7592-1	JEL-16-7906-1	JEL-16-8513-1	JEL-16-9421-1	JEL-16-9689-1	JEL-16-10326-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01				0.03	0.04	0.04	0.06	0.03	0.03	0.03	0.03	0.05	0.03	0.03	0.02	<0.013	<0.013	<0.013	<0.013	0.02
Acenaphthene	µg/L	0.01				0.02	<0.013	<0.013	<0.013	<0.013	0.05	<0.013	0.12	<0.013	0.06	0.69	<0.013	<0.013	<0.013	<0.013	0.02	<0.013	0.03
Fluorene	µg/L	0.01				<0.014	<0.014	<0.014	<0.014	<0.014	0.03	<0.014	0.75	<0.014	0.18	1.27	<0.014	<0.014	<0.014	<0.014	0.03	<0.014	<0.014
Phenanthrene	µg/L	0.01				<0.011	0.02	0.02	0.03	<0.011	0.02	0.02	0.17	0.02	0.3	0.15	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		0.05	0.08	0.07	**0.12**	0.05	0.05	0.06	0.06	0.08	0.04	0.04	0.02	0.02	<0.013	<0.013	0.02	<0.013	0.04
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.06	0.08	0.1	0.08	0.06	0.07	0.06	0.12	0.12	0.1	**0.59**	0.03	0.02	<0.012	<0.012	0.03	<0.012	0.04
Pyrene	µg/L	0.01				0.04	0.06	0.07	0.07	0.04	0.04	0.04	0.05	0.07	0.06	0.17	0.02	0.02	<0.013	<0.013	0.02	<0.013	0.03
Benz(a)anthracene	µg/L	0.01				<0.015	0.02	0.02	0.02	<0.015	<0.015	<0.015	<0.015	0.03	0.02	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.04	0.02	<0.011	<0.011	0.02	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	0.02	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		0.01	0.01	**0.02**	**0.02**	<0.01	0.01	0.01	<0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.1	0.14	0.13	0.21	0.08	0.18	0.11	1.13	0.15	0.61	2.18	0.04	0.02	0	0	0.07	0	0.09
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.11	0.19	0.23	0.24	0.12	0.14	0.13	0.19	0.27	0.21	0.76	0.05	0.07	0	0	0.05	0	0.07
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**0.22**	**0.34**	**0.37**	**0.46**	0.2	**0.33**	**0.25**	**1.32**	**0.43**	**0.83**	**2.94**	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location	SW101																
					Well	-																
					Date	22/06/2016	29/06/2016	06/07/2016	15/09/2014	22/10/2014	12/11/2014	04/12/2014	25/03/2015	24/04/2015	28/05/2015	25/06/2015	23/07/2015	19/08/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-10651-1	JEL-16-11007-1	JEL-16-11260-1	JEL-14-10593-1	JEL-14-12828-1	JEL-14-13777-1	JEL-14-14908-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.014	<0.014	0.05	0.01	0.09	<0.014	<0.014	0.03	<0.014	0.09	<0.1	<0.1	<0.1	1.6
Acenaphthylene	µg/L	0.01				<0.013	0.02	<0.013	<0.013	<0.013	<0.013	<0.01	<0.013	<0.013	0.03	<0.013	<0.013	<0.013	0.03	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	0.04	0.04	0.15	0.15	0.02	0.03	<0.013	<0.013	0.03	0.72	0.1	<0.013	0.75
Fluorene	µg/L	0.01				<0.014	0.07	0.04	<0.014	0.03	0.02	0.03	0.04	<0.014	<0.014	<0.014	<0.014	<0.014	0.13	0.03	<0.014	0.17
Phenanthrene	µg/L	0.01				<0.011	0.03	<0.011	0.02	0.03	0.02	0.02	0.03	<0.011	0.03	<0.011	<0.011	0.02	0.03	0.03	0.02	0.1
Anthracene	µg/L	0.01		**0.1**[#2]		0.02	0.03	<0.013	<0.013	<0.013	<0.013	<0.01	<0.013	<0.013	0.04	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	0.04	<0.012	0.02	<0.012	<0.012	<0.01	0.02	<0.012	**0.62**	<0.012	0.03	0.03	<0.012	<0.012	0.02	0.03
Pyrene	µg/L	0.01				<0.013	0.02	<0.013	0.02	<0.013	<0.013	<0.01	<0.013	<0.013	1.2	<0.013	0.04	0.02	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.01	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.01	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.02	0.15	0.04	0.02	0.1	0.13	0.21	0.31	0.02	0.13	0.03	0	0.14	0.91	0.16	0.02	2.62
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0.06	0	0.04	0	0	0	0.02	0	1.82	0	0.07	0.05	0	0	0.02	0.03
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	**0.21**	<0.195	<0.195	<0.195	<0.195	0.2	**0.33**	<0.195	**1.95**	<0.195	<0.195	<0.195	**0.91**	<0.195	<0.195	**2.65**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location					SW202									-			
Well																						
Date					29/03/2016	27/04/2016	25/05/2016	29/06/2016	22/10/2014	11/11/2014	04/12/2014	25/03/2015	24/04/2015	28/05/2015	25/06/2015	23/07/2015	19/08/2015	06/10/2015	04/11/2015	25/11/2015	21/12/2015
Sample Type					Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SDG					JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-14-12828-1	JEL-14-13777-1	JEL-14-14908-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-14437-1	JEL-15-15898-1	JEL-15-16995-1	JEL-15-18295-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	2.4	<0.1	<0.1	<0.014	<0.014	<0.01	<0.014	<0.014	<0.014	0.03	<0.014	0.04	<0.1	<0.1	0.2	<0.1
Acenaphthylene	µg/L	0.01				<0.013	0.03	<0.013	0.02	<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				<0.013	1.77	<0.013	0.56	0.04	<0.013	0.08	0.11	<0.013	0.02	0.02	0.02	0.02	0.02	0.06	0.27	<0.013
Fluorene	µg/L	0.01				<0.014	0.6	<0.014	0.16	0.02	<0.014	0.02	0.05	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.07	<0.014
Phenanthrene	µg/L	0.01				0.08	0.39	0.11	0.07	0.03	<0.011	<0.01	0.04	<0.011	<0.011	<0.011	0.02	0.02	<0.011	<0.011	0.03	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.07	**0.16**	0.1	0.02	0.02	<0.012	<0.01	0.02	<0.012	<0.012	<0.012	<0.012	0.02	<0.012	<0.012	<0.012	<0.012
Pyrene	µg/L	0.01				0.02	0.07	0.03	<0.013	<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.01	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.01	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.08	5.19	0.11	0.81	0.09	0	0.1	0.2	0	0.02	0.05	0.04	0.08	0.02	0.06	0.57	0
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.09	0.23	0.13	0.02	0.02	0	0	0.02	0	0	0	0	0.02	0	0	0	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	**5.42**	**0.24**	**0.83**	<0.195	<0.195	0.1	**0.22**	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	**0.57**	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
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Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location							SW204										
					Well																	-
					Date	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	22/10/2014	11/11/2014	04/12/2014	25/03/2015	24/04/2015	28/05/2015	25/06/2015	23/07/2015	19/08/2015	06/10/2015	04/11/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-14-12828-1	JEL-14-13777-1	JEL-14-14908-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-14437-1	JEL-15-15898-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	0.5	<0.1	0.4	<0.1	<0.1	0.02	0.02	0.52	<0.014	<0.014	<0.014	<0.014	<0.014	0.04	<0.1	<0.1
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	0.02	<0.013	<0.013	0.03	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				<0.013	0.17	<0.013	0.34	<0.013	0.42	0.02	<0.013	0.05	0.02	<0.013	<0.013	<0.013	<0.013	<0.013	0.02	0.04
Fluorene	µg/L	0.01				<0.014	0.04	<0.014	0.11	<0.014	0.15	<0.014	<0.014	<0.01	0.02	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Phenanthrene	µg/L	0.01				<0.011	0.02	0.02	0.05	0.05	0.06	<0.011	0.02	<0.01	0.04	<0.011	<0.011	<0.011	<0.011	0.02	<0.011	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	<0.012	<0.012	<0.012	0.03	0.11	<0.012	0.02	<0.01	0.03	<0.012	0.02	<0.012	<0.012	0.02	<0.012	<0.012
Pyrene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	0.02	0.04	<0.013	0.02	<0.01	0.02	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.01	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.01	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0	0.73	0.02	0.9	0.05	0.65	0.04	0.04	0.6	0.08	0	0	0	0	0.06	0.02	0.04
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0	0	0	0.05	0.15	0	0.04	0	0.05	0	0.02	0	0	0.02	0	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	**0.73**	<0.195	**0.9**	<0.195	**0.8**	<0.195	<0.195	**0.6**	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location									SW205								
					Well									-								
					Date	25/11/2015	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	11/11/2014	04/12/2014	25/03/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-14-13777-1	JEL-14-14908-1	JEL-15-5375-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.014	0.01	<0.014	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.29	<0.013	<0.01	0.1	<0.013	0.1	0.24	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				0.05	0.06	0.02	0.09	0.02	0.05	0.34	4.59	<0.013	0.02	0.05	<0.013	0.02	0.04	<0.013	<0.013	0.02
Fluorene	µg/L	0.01				<0.014	0.02	<0.014	0.02	<0.014	0.02	0.1	0.07	<0.014	<0.01	0.04	<0.014	<0.014	0.04	<0.014	<0.014	<0.014
Phenanthrene	µg/L	0.01				<0.011	0.02	0.02	<0.011	0.03	0.02	0.09	0.08	<0.011	<0.01	0.11	<0.011	0.02	0.07	<0.011	0.03	0.02
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	**0.33**	0.05	0.04	**0.24**	0.03	**0.18**	**0.44**	0.02	0.03	0.03
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.02	<0.012	0.06	<0.012	<0.012	<0.012	0.03	**7.24**	0.04	<0.01	**0.37**	<0.012	**0.15**	**0.65**	0.02	0.03	0.02
Pyrene	µg/L	0.01				<0.013	<0.013	0.04	<0.013	<0.013	<0.013	0.02	5.87	0.03	<0.01	0.32	<0.013	0.15	0.59	<0.013	0.02	0.02
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.33	<0.015	<0.01	0.06	<0.015	0.02	0.09	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.32	<0.011	<0.01	0.1	<0.011	0.04	0.14	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.04	<0.016	<0.01	0.09	<0.016	0.03	0.07	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	**0.05**	**0.05**	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	**0.04**	**0.06**	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.09**	<0.01	<0.01	**0.09**	<0.01	**0.06**	**0.12**	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	<0.01	<0.01	**0.04**	<0.01	**0.02**	**0.04**	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.15	0.1	0.04	0.11	0.05	0.09	0.63	5.36	0.05	0.07	0.54	0.03	0.32	0.83	0.02	0.06	0.07
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.02	0	0.1	0	0	0	0.05	13.92	0.07	0	1.07	0	0.56	1.81	0.02	0.05	0.04
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	**0.68**	**19.28**	<0.195	<0.1	**1.61**	<0.195	**0.88**	**2.64**	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location			SW206														
					Well													-				
					Date	25/05/2016	29/06/2016	22/10/2014	11/11/2014	05/12/2014	25/03/2015	24/04/2015	28/05/2015	25/06/2015	23/07/2015	19/08/2015	06/10/2015	04/11/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-9433-1	JEL-16-11007-1	JEL-14-12828-1	JEL-14-13777-1	JEL-14-14908-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-14437-1	JEL-15-15898-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	0.03	<0.014	0.04	0.08	0.06	<0.014	0.04	<0.014	0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01				<0.013	0.07	<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				<0.013	0.26	0.12	<0.013	0.08	0.08	0.15	0.03	0.12	0.05	0.21	0.03	<0.013	0.04	0.06	0.08	0.02
Fluorene	µg/L	0.01				<0.014	0.12	0.03	<0.014	0.02	0.03	0.04	<0.014	0.04	0.02	0.07	<0.014	<0.014	<0.014	0.02	0.03	<0.014
Phenanthrene	µg/L	0.01				<0.011	0.06	0.02	<0.011	<0.01	0.08	0.04	<0.011	0.03	0.02	0.06	<0.011	<0.011	<0.011	0.02	0.02	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		0.04	**0.17**	<0.013	<0.013	<0.01	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.05	**0.45**	<0.012	<0.012	<0.01	0.08	<0.012	<0.012	<0.012	<0.012	0.03	<0.012	<0.012	<0.012	<0.012	0.02	<0.012
Pyrene	µg/L	0.01				0.03	0.28	<0.013	<0.013	<0.01	0.03	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	0.03	<0.015	<0.015	<0.01	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	0.04	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	0.01	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.01	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	**0.04**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.04	0.68	0.2	0	0.14	0.27	0.29	0.03	0.23	0.09	0.4	0.03	0	0.04	0.1	0.13	0.02
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.08	0.85	0	0	0.01	0.11	0	0	0	0	0.03	0	0	0	0	0.02	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	**1.53**	0.2	<0.195	0.2	**0.38**	**0.29**	<0.195	**0.23**	<0.195	**0.43**	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
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Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location					SW207													
					Well																		-
					Date	29/03/2016	27/04/2016	25/05/2016	29/06/2016	22/10/2014	11/11/2014	04/12/2014	06/01/2015		13/01/2015	04/02/2015	04/03/2015	25/03/2015	24/04/2015	28/05/2015	25/06/2015	23/07/2015	19/08/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-14-12828-1	JEL-14-13777-1	JEL-14-14908-1		JEL-15-2068-1		JEL-15-3255-1	JEL-15-4439-1	JEL-15-5375-1	JEL-15-6689-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1
PAH																							
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.1	<0.014	<0.014	<0.01	<0.1	<0.014	<0.1	2.62	1.6	0.04	<0.014	<0.014	0.03	<0.014	0.04
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	0.04	0.02	<0.011	0.02	0.0138	0.02	0.04	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				0.03	0.03	<0.013	0.07	<0.013	0.02	0.09	<0.015	0.05	<0.015	0.21	0.51	0.02	<0.013	<0.013	<0.013	<0.013	0.02
Fluorene	µg/L	0.01				<0.014	<0.014	<0.014	0.04	<0.014	<0.014	<0.01	<0.014	0.03	<0.014	0.03	0.15	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Phenanthrene	µg/L	0.01				<0.011	<0.011	<0.011	0.04	<0.011	0.02	<0.01	<0.022	0.04	<0.022	0.02	0.17	0.02	<0.011	<0.011	<0.011	<0.011	0.03
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	0.06	0.09	0.06	0.0233	0.05	0.0736	0.05	0.08	0.05	0.04	0.03	<0.013	0.04	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	<0.012	<0.012	0.02	<0.012	0.06	<0.01	0.023	0.05	0.042	0.04	0.08	0.07	<0.012	<0.012	<0.012	<0.012	0.02
Pyrene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	0.05	<0.01	0.0196	0.04	0.0341	0.03	0.05	0.04	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.01	<0.017	<0.015	<0.017	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.013	<0.011	<0.013	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.01	<0.009	<0.016	<0.009	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.014	<0.011	<0.014	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.016	<0.01	<0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.01	<0.016	<0.011	<0.016	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.023	<0.01	<0.023	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.027	<0.01	<0.027	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.03	0.03	0	0.15	0.06	0.17	0.17	0.0233	0.19	0.0874	2.95	2.55	0.13	0.04	0.03	0.03	0.04	0.09
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0	0	0.02	0	0.11	0	0.0426	0.09	0.0761	0.07	0.13	0.11	0	0	0	0	0.02
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	<0.195	<0.195	<0.195	<0.195	**0.28**	0.2	0.0659	**0.28**	0.1635	**3.02**	**2.68**	**0.24**	<0.195	<0.195	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location											SW210						
					Well																	-
					Date	06/10/2015	04/11/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	28/05/2015	25/06/2015	23/07/2015	19/08/2015	05/10/2015	04/11/2015	25/11/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-15-14437-1	JEL-15-15898-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-14437-1	JEL-15-15898-1	JEL-15-16995-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.014	0.04	<0.014	0.04	<0.1	<0.1	0.1
Acenaphthylene	µg/L	0.01				<0.013	<0.013	0.03	0.05	0.25	0.02	<0.013	<0.013	<0.013	0.16	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				0.03	<0.013	<0.013	<0.013	0.19	0.03	<0.013	<0.013	0.02	0.24	<0.013	<0.013	<0.013	<0.013	0.03	0.04	0.12
Fluorene	µg/L	0.01				<0.014	<0.014	<0.014	<0.014	0.08	<0.014	<0.014	<0.014	<0.014	0.3	<0.014	<0.014	<0.014	<0.014	0.02	<0.014	0.03
Phenanthrene	µg/L	0.01				<0.011	<0.011	<0.011	0.02	0.13	<0.011	0.03	<0.011	0.02	0.08	<0.011	<0.011	<0.011	0.02	0.06	0.02	0.02
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	0.05	0.06	**0.12**	**0.53**	0.04	0.03	0.03	0.06	**0.28**	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	<0.012	0.02	0.09	**2.45**	0.02	0.03	<0.012	0.05	**0.66**	<0.012	<0.012	<0.012	0.02	0.02	<0.012	<0.012
Pyrene	µg/L	0.01				<0.013	<0.013	0.02	0.06	1.39	<0.013	0.02	<0.013	0.03	0.41	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	0.17	<0.015	<0.015	<0.015	<0.015	0.04	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	0.02	0.21	<0.011	<0.011	<0.011	<0.011	0.06	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	0.04	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	**0.02**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	0.01	**0.06**	<0.01	<0.01	<0.01	<0.01	**0.02**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	**0.03**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.03	0.05	0.09	0.19	1.18	0.09	0.06	0.03	0.1	1.06	0	0.04	0	0.06	0.11	0.06	0.27
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0	0.04	0.18	4.37	0.02	0.05	0	0.08	1.19	0	0	0	0.02	0.02	0	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	<0.195	<0.195	**0.38**	**5.55**	<0.195	<0.195	<0.195	<0.195	**2.26**	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	**0.27**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location	SW211																
					Well	-																
					Date	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	28/05/2015	25/06/2015	23/07/2015	19/08/2015	05/10/2015	04/11/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-14437-1	JEL-15-15898-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.014	0.03	<0.014	<0.014	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	0.02	<0.013	0.07	<0.013	<0.013	<0.013	<0.013	<0.013	0.04	<0.013	<0.013	<0.013	<0.013
Fluorene	µg/L	0.01				<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.02	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Phenanthrene	µg/L	0.01				<0.011	<0.011	<0.011	0.02	<0.011	<0.011	0.03	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	0.02	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
Pyrene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0	0	0	0.02	0.02	0	0.12	0	0.03	0	0	0	0.04	0	0	0	0
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0	0	0	0	0	0.02	0	0	0	0	0	0	0	0	0	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location	SW212										SW213					Upstream PDM 1		
					Well					-								-					
					Date	29/03/2016	27/04/2016	25/05/2016	29/06/2016	27/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016	27/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	25/02/2015	15/09/2014	16/09/2014
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-16-4087-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1	JEL-16-4087-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-15-4118-1	JEL-14-10593-1	
PAH																							
Naphthalene	µg/L	0.01		**130**[#2]		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.014	<0.014	0
Acenaphthylene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	0.02	<0.013	<0.013	<0.013	<0.013	0.03	0.05	<0.013	<0.013	<0.013	<0.013	0.02	<0.013	0
Acenaphthene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	0.02	0.2	<0.013	<0.013	<0.013	0.13	0.04	0.09	<0.013	<0.013	0.02	<0.013	<0.013	0
Fluorene	µg/L	0.01				<0.014	<0.014	<0.014	0.02	<0.014	0.02	<0.014	<0.014	<0.014	0.06	0.02	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0
Phenanthrene	µg/L	0.01				0.03	<0.011	0.02	0.03	<0.011	<0.011	0.03	<0.011	0.02	0.04	0.04	<0.011	<0.011	<0.011	0.02	<0.011	0.02	0
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	0.05	0.02	<0.013	<0.013	0.02	0.08	**0.11**	<0.013	0.02	0.02	0.05	0.06	<0.013	0
Fluoranthene	µg/L	0.01		**0.12**[#2]		<0.012	<0.012	<0.012	<0.012	0.09	0.03	0.02	<0.012	0.02	0.08	**0.75**	0.02	0.02	<0.012	0.07	0.03	0.02	0
Pyrene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	0.06	<0.013	<0.013	<0.013	<0.013	0.06	0.38	<0.013	<0.013	<0.013	0.03	0.07	<0.013	0
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.03	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.04	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.03	0	0.02	0.05	0.09	0.24	0.03	0	0.04	0.34	0.26	0.09	0.02	0.02	0.09	0.08	0.02	0
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0	0	0	0.15	0.03	0.02	0	0.02	0.14	1.21	0.02	0.02	0	0.1	0.1	0.02	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		<0.195	<0.195	<0.195	<0.195	**0.24**	**0.27**	<0.195	<0.195	<0.195	**0.48**	**1.48**	<0.195	<0.195	<0.195	<0.195	<0.195	<0.195	0

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location																			
					Well																			
					Date	23/09/2014	30/09/2014	07/10/2014	08/10/2014	14/10/2014	21/10/2014	22/10/2014	28/10/2014	04/11/2014	11/11/2014		19/11/2014	25/11/2014	02/12/2014	04/12/2014	09/12/2014	16/12/2014	22/12/2014	06/01/
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Norr
					SDG							JEL-14-12828-1				JEL-14-13777-1				JEL-14-14908-1				
PAH																								
Naphthalene	µg/L	0.01		**130**[#2]		0	0	0	0	0	0	<0.014	0	0	0 - 0.1	0.03	0	0	0	0.01	0	0	<0.1	<0.1
Acenaphthylene	µg/L	0.01				0	0	0	0.0192	0	0	<0.013	0	0 - 0.0216	0	<0.013	0	0.0113	0 - 0.011	<0.01	0	0	<0.011	<0.011
Acenaphthene	µg/L	0.01				0.115	0.0292	0.0246	0	0 - 0.0468	0.25	0.04	0	0.0252 - 0.0495	0 - 0.0751	0.09	0	0.0867	0 - 0.0654	0.06	0 - 0.0223	0 - 0.0441	0.154	<0.015 - 0.0151
Fluorene	µg/L	0.01				0.0323	0	0	0	0 - 0.0648	0.0699	0.02	0	0.0164 - 0.0238	0 - 0.0184	0.02	0	0.0252	0.0171 - 0.0172	0.01	0	0	0.0306	<0.014
Phenanthrene	µg/L	0.01				0	0	0	0	0 - 0.0589	0.037	0.02	0	0 - 0.0693	0	<0.011	0	0.0624	0 - 0.299	0.01	0	0	<0.022	<0.022
Anthracene	µg/L	0.01		**0.1**[#2]		0	0	0	**0.115**	0 - 0.0471	0	<0.013	0	0 - 0.0919	**0 - 0.127**	<0.013	0	0	0 - 0.042	<0.01	0 - 0.0841	0 - 0.0296	<0.015	<0.015 - 0.0535
Fluoranthene	µg/L	0.01		**0.12**[#2]		0	0	0	0.0317	0 - 0.025	0	<0.012	0	**0 - 0.282**	0	<0.012	0	0.0315	**0 - 0.637**	<0.01	0	0	<0.017	<0.017
Pyrene	µg/L	0.01				0	0	0	0.062	0 - 0.0689	0	<0.013	0	0 - 0.268	0 - 0.0277	<0.013	0	0	0 - 0.372	<0.01	0 - 0.0263	0 - 0.0167	<0.015	<0.015 - 0.0319
Benz(a)anthracene	µg/L	0.01				0	0	0	0	0	0	<0.015	0	0	0	<0.015	0	0	0	<0.01	0	0	<0.017	<0.017
Chrysene	µg/L	0.01				0	0	0	0	0	0	<0.011	0	0 - 0.0307	0	<0.011	0	0	0	<0.01	0	0	<0.013	<0.013
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		0	0	0	0	0	0	<0.016	0	0 - 0.0126	0	<0.016	0	0	0	0.01	0	0	<0.009	<0.009
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		0	0	0	0	0	0	<0.011	0	**0 - 0.0151**	0	<0.011	0	0	0	<0.01	0	0	<0.014	<0.014
Dibenz(a,h)anthracene	µg/L	0.01				0	0	0	0	0	0	<0.01	0	0	0	<0.01	0	0	0	<0.01	0	0	<0.016	<0.016
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		0	0	0	0	0	0	<0.011	0	**0 - 0.0175**	0	<0.011	0	0	0	<0.01	0	0	<0.016	<0.016
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		0	0	0	0	0	0	<0.01	0	**0 - 0.029**	0	<0.01	0	0	0	<0.01	0	0	<0.023	<0.023
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		0	0	0	0	0	0	<0.01	0	0	0	<0.01	0	0	0	<0.01	0	0	<0.027	<0.027
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			0.1473	0.0292	0.0246	0.1342	0	0.3569	0.08	0	0	0	0.14	0	0.1856	0	0.09	0	0	0.1846	0
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0	0	0	0.0937	0	0	0	0	0	0	0	0	0.0315	0	0.01	0	0	0	0
PAH 16 Total	µg/L	0.1		**0.2**[#4]		0.1473	0.0292	0.0246	**0.2279**	0.141 - 0.1705	**0.3569**	<0.195	-	**0.0659 - 0.8867**	0.1547 - 0.1935	<0.195	-	**0.2171**	**0.0825 - 1.3782**	0.1	0.0223 - 0.1104	0.0441 - 0.0463	0.1846	0.0151 - 0.0854

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location Well																	
Date					2015	13/01/2015	29/01/2015	04/02/2015	10/02/2015	18/02/2015	04/03/2015	11/03/2015	25/03/2015		01/04/2015	08/04/2015	15/04/2015	22/04/2015	24/04/2015	29/04/2015	06/05/2015	12/05/2015
Sample Type					nal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SDG					JEL-15-2068-1		JEL-15-3089-1	JEL-15-3255-1	JEL-15-3475-1	JEL-15-3819-1	JEL-15-4439-1	JEL-15-4747-1	JEL-15-5373-1	JEL-15-5375-1	JEL-15-5650-1	JEL-15-5862-1	JEL-15-6176-1	JEL-15-6471-1	JEL-15-6689-1	JEL-15-6770-1	JEL-15-7035-1	JEL-15-7232-1
PAH																						
Naphthalene	µg/L	0.01		**130**[#2]	0.7 - 2.29	<0.1	<0.014	<0.014	0.04	1.34	0.04 - 0.18	<0.014	0.33	<0.014	<0.014	0.05	0.07	0.08	<0.014	<0.014	<0.014	<0.014
Acenaphthylene	µg/L	0.01			<0.013 - 0.03	<0.011	<0.013	<0.013	0.02	0.3	<0.013	0.06	0.04	<0.013	0.02	0.02	0.02	0.04	<0.013	<0.013	0.03	0.03
Acenaphthene	µg/L	0.01			0.04 - 0.31	<0.015	0.04	0.03	0.2	13.38	0.05 - 0.46	0.42	0.73	0.02	0.04	0.26	0.49	1.31	<0.013	0.04	0.02	0.05
Fluorene	µg/L	0.01			0.02 - 0.06	<0.014	0.06	<0.014	0.03	4.45	<0.014 - 0.12	0.27	0.26	0.02	<0.014	0.09	0.1	0.28	<0.014	<0.014	<0.014	0.04
Phenanthrene	µg/L	0.01			0.02 - 0.08	<0.022	0.2	<0.011	0.02	6.22	0.05 - 0.08	0.14	0.14	0.03	<0.011	0.08	0.07	0.06	<0.011	<0.011	0.02	0.05
Anthracene	µg/L	0.01		**0.1**[#2]	<0.013 - 0.04	<0.015 - 0.0379	0.07	<0.013	0.03	**0.27**	<0.013 - 0.05	**0.12**	0.05	<0.013	0.04	0.04	0.03	0.02	<0.013	0.04	**0.11**	0.07
Fluoranthene	µg/L	0.01		**0.12**[#2]	<0.012 - 0.06	<0.017	0.1	<0.012	0.04	**6.23**	<0.012	**3.3**	**0.29**	<0.012	**0.31**	**0.14**	0.1	**0.14**	<0.012	0.04	**0.13**	**0.29**
Pyrene	µg/L	0.01			<0.013 - 0.06	<0.015	0.09	<0.013	0.04	3	<0.013 - 0.04	2.29	0.19	<0.013	0.22	0.1	0.07	0.08	<0.013	0.03	0.11	0.2
Benz(a)anthracene	µg/L	0.01			<0.015	<0.017	<0.015	<0.015	<0.015	0.07	<0.015	0.03	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.05
Chrysene	µg/L	0.01			<0.011	<0.013	<0.011	<0.011	<0.011	0.05	<0.011	0.05	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.06
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]	<0.016	<0.009	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.03
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]	<0.011	<0.014	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01			<0.01	<0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]	<0.011	<0.016	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]	<0.01	<0.023	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.06**
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]	<0.01	<0.027	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]		0	0	0.37	0.03	0.34	25.96	0	1.01	1.55	0.07	0.1	0.54	0.78	1.79	0	0.08	0.18	0.24
High Molecular Weight PAHs (Sum)	µg/L		402[#1]		0	0	0.19	0	0.08	9.35	0	5.67	0.48	0	0.53	0.24	0.17	0.22	0	0.07	0.24	0.72
PAH 16 Total	µg/L	0.1		**0.2**[#4]	**1.34 - 2.37**	0.0379 - 0.1	**0.56**	<0.195	**0.42**	**35.31**	**0.23 - 0.84**	**6.68**	**2.03**	<0.195	**0.63**	**0.78**	**0.95**	**2.01**	<0.195	<0.195	**0.42**	**0.96**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
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GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 2
Analytical Results
Surface Water Data September 2014 to June 2016
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location														
					Well														
					Date	28/05/2015	25/06/2015	23/07/2015	19/08/2015	06/10/2015	04/11/2015	25/11/2015	21/12/2015	26/01/2016	24/02/2016	29/03/2016	27/04/2016	25/05/2016	29/06/2016
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					SDG	JEL-15-8041-1	JEL-15-9339-1	JEL-15-10600-1	JEL-15-11712-1	JEL-15-14437-1	JEL-15-15898-1	JEL-15-16995-1	JEL-15-18295-1	JEL-16-4085-1	JEL-16-5472-1	JEL-16-6946-1	JEL-16-8308-1	JEL-16-9433-1	JEL-16-11007-1
PAH																			
Naphthalene	µg/L	0.01		**130**[#2]		0.06	<0.014	<0.014	0.02	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.01				0.02	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Acenaphthene	µg/L	0.01				0.66	0.03	0.1	0.5	0.1	0.02	0.12	0.14	0.17	0.06	<0.013	0.05	<0.013	0.2
Fluorene	µg/L	0.01				0.2	0.03	0.03	0.13	0.02	<0.014	0.03	0.04	0.05	0.02	<0.014	0.02	<0.014	0.08
Phenanthrene	µg/L	0.01				0.06	0.03	<0.011	0.06	<0.011	<0.011	<0.011	0.02	0.03	<0.011	<0.011	0.02	0.02	0.04
Anthracene	µg/L	0.01		**0.1**[#2]		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Fluoranthene	µg/L	0.01		**0.12**[#2]		0.03	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	0.02
Pyrene	µg/L	0.01				<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
Benz(a)anthracene	µg/L	0.01				<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.01				<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(a)pyrene	µg/L	0.009		**0.27**[#2]		<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		**0.01**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.01		**0.0082**[#2]		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.017**[#2]		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L		2010[#1]			1	0.09	0.13	0.71	0.12	0.02	0.25	0.3	0.25	0.08	0	0.09	0.02	0.32
High Molecular Weight PAHs (Sum)	µg/L		402[#1]			0.03	0	0	0	0	0	0	0	0	0	0	0	0	0.02
PAH 16 Total	µg/L	0.1		**0.2**[#4]		**1.03**	<0.195	<0.195	**0.71**	<0.195	<0.195	**0.25**	**0.3**	**0.25**	<0.195	<0.195	<0.195	<0.195	**0.34**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbo
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 3
Analytical Results
Surface Water Average Values (Sep 2014 - Jun 2016)
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	Location	Bridge 2	Farmers Pond	Final Exit	Licence Pt A	Licence Pt E	SW101	SW202	SW204	SW205	SW206	SW207	SW210	SW211	SW212	SW213
					Date	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Sep14 to Jun16	Jan16 to Jun16	Jan16 to Jun16
					Sample Type	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average
					SDG															
PAH																				
Naphthalene	µg/L	0.1		**2**[#3]		<0.1	<0.1	0.12	0.08	<0.1	0.26	<0.1	<0.1	<0.1	<0.1	0.21	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.013				0.024	0.019	0.074	0.053	0.045	<0.013	<0.013	0.023	0.05	<0.013	0.031	<0.013	<0.013	0.013	0.015
Acenaphthene	µg/L	0.013				0.045	0.32	0.11	0.3	0.04	0.24	0.086	0.28	0.04	0.064	0.063	0.024	<0.013	0.062	0.033
Fluorene	µg/L	0.014				0.022	0.11	0.052	0.093	0.046	0.071	0.029	0.018	0.023	0.021	0.03	<0.014	<0.014	0.018	<0.014
Phenanthrene	µg/L	0.011				0.033	0.1	0.065	0.061	0.035	0.056	0.02	0.021	0.031	0.02	0.028	0.015	<0.011	0.018	0.015
Anthracene	µg/L	0.013		**0.1**[#3]		0.056	0.014	**0.19**	**0.12**	0.08	<0.013	<0.013	0.023	**0.12**	0.0064	0.078	<0.013	<0.013	0.031	0.041
Fluoranthene	µg/L	0.012		**0.0063**[#3]		**0.089**	**0.083**	**0.58**	**0.19**	**0.11**	**0.065**	**0.015**	**0.4**	**0.16**	**0.013**	**0.16**	<0.012	<0.012	**0.041**	**0.17**
Pyrene	µg/L	0.013				0.067	0.052	0.33	0.17	0.1	0.082	<0.013	0.32	0.13	<0.013	0.094	<0.013	<0.013	0.024	0.086
Benz(a)anthracene	µg/L	0.015				0.011	<0.015	0.038	0.018	0.028	<0.015	<0.015	0.024	0.023	<0.015	0.016	<0.015	<0.015	<0.015	<0.015
Chrysene	µg/L	0.011				0.016	<0.011	0.049	0.027	0.029	<0.011	<0.011	0.022	0.033	<0.011	0.017	<0.011	<0.011	<0.011	0.012
Benzo(a) pyrene	µg/L	0.016		**0.00017**[#3]		<0.016	<0.016	<0.016	**0.017**	**0.018**	<0.016	<0.016	<0.016	**0.023**	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.011		**0.00017**[#3 B[a]P]		<0.011	<0.011	<0.011	**0.014**	<0.011	<0.011	<0.011	<0.011	**0.014**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Dibenz(a,h)anthracene	µg/L	0.01				0.005	0.0038	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	0.011		**0.00017**[#3 B[a]P]		<0.011	<0.011	<0.011	**0.012**	<0.011	<0.011	<0.011	<0.011	**0.014**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.00017**[#3 B[a]P]		**0.013**	<0.01	**0.022**	**0.027**	**0.027**	<0.01	<0.01	<0.01	**0.031**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.00017**[#3 B[a]P]		<0.01	<0.01	**0.011**	**0.012**	**0.01**	<0.01	<0.01	<0.01	**0.013**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Low Molecular Weight PAHs (Sum)	µg/L	n/a	2010[#1]			0.18	0.63	0.58	0.68	0.25	0.61	0.19	0.39	0.25	0.11	0.39	n/a	n/a	0.12	0.1
High Molecular Weight PAHs (Sum)	µg/L	n/a	402[#1]			0.2	0.14	1.03	0.47	0.31	0.14	0.01	0.75	0.41	0.19	0.27	n/a	n/a	0.06	0.27
PAH 16 Total	µg/L	0.195		**0.2**[#4]		**0.38**	**0.78**	**1.6**	**1.1**	**0.58**	**0.75**	**0.24**	**1.2**	**0.66**	<0.195	**0.73**	<0.195	<0.195	**0.21**	**0.37**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (Calves)
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 3
Analytical Results
Surface Water Average Values (Sep 2014 - Jun 2016)
Saint Gobain T/A PDM

	Units	Method Detection Limit	GAC Livestock	GAC Surface Water	**Location**	Upstream PDM 1
					Date	Sep14 to Jun16
					Sample Type	Average
					SDG	
PAH						
Naphthalene	µg/L	0.1		**2**[#3]		<0.1
Acenaphthylene	µg/L	0.013				0.016
Acenaphthene	µg/L	0.013				0.38
Fluorene	µg/L	0.014				0.12
Phenanthrene	µg/L	0.011				0.15
Anthracene	µg/L	0.013		**0.1**[#3]		0.028
Fluoranthene	µg/L	0.012		**0.0063**[#3]		**0.22**
Pyrene	µg/L	0.013				0.13
Benz(a)anthracene	µg/L	0.015				<0.015
Chrysene	µg/L	0.011				0.012
Benzo(a) pyrene	µg/L	0.016		**0.00017**[#3]		<0.016
Indeno(1,2,3-c,d)pyrene	µg/L	0.011		**0.00017**[#3 B[a]P]		<0.011
Dibenz(a,h)anthracene	µg/L	0.01				<0.01
Benzo(g,h,i)perylene	µg/L	0.011		**0.00017**[#3 B[a]P]		<0.011
Benzo(b)fluoranthene	µg/L	0.01		**0.00017**[#3 B[a]P]		<0.01
Benzo(k)fluoranthene	µg/L	0.01		**0.00017**[#3 B[a]P]		<0.01
Low Molecular Weight PAHs (Sum)	µg/L	n/a	2010[#1]			0.7
High Molecular Weight PAHs (Sum)	µg/L	n/a	402[#1]			0.34
PAH 16 Total	µg/L	0.195		**0.2**[#4]		**1.1**

Comments
#1 API 2004 Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons (Ca
#2 EU Env. Objectives Regs 2015. (Ire) MAC-EQS Inland
#3 EU Env. Objectives Regs 2015. (Ire) AA-EQS Inland
#4 IGV Ireland 2003 (EQS)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available

Key
XXX Exceedance of GAC Livestock
XXX Exceedance of GAC Surface Water

Table 4
Analytical Results
Surface Water Monitoring Trend Analysis
Saint Gobain T/A PDM

Trend Analysis using Mann Kendal Trend with Confidence = 0.1

Location_Code	ChemName	Total_or_Filtered	Max Value Last	Mann Kendal Trend	No. of Points	S
Bridge 2	PAH 16 Total	T	No	No Trend	16	14
Final Exit	PAH 16 Total	T	No	Up	23	91
Licence Pt A	PAH 16 Total	T	Yes	Up	79	1293
Licence Pt E	PAH 16 Total	T	No	Down	144	1196
SW101	PAH 16 Total	T	No	Up	18	40
SW202	PAH 16 Total	T	No	Up	19	33
SW204	PAH 16 Total	T	Yes	Up	22	26
SW205	PAH 16 Total	T	No	No Trend	11	2
SW206	PAH 16 Total	T	No	Down	19	54
SW207	PAH 16 Total	T	No	Down	24	43
SW210	PAH 16 Total	T	No	No Trend	14	1
SW211	PAH 16 Total	T	No	No Trend	14	0
SW212	PAH 16 Total	T	Yes	No Trend	6	0
SW213	PAH 16 Total	T	No	No Trend	5	4
Upstream PDM 1	PAH 16 Total	T	No	Up	64	102

APPENDIX A - KICK SAMPLING REPORTS

General Information					
Sample Location	SW203	**Bank Width (m)**	2	**Substratum Condition**	Compact
Site Location	Kill, Co. Kildare	**Wet Width (m)**	0.5	**Degree of Siltation**	Moderate
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.1 - 0.2	**Depth of Mud (m)**	0.05 - 0.1
Survey Date	16/02/2015	**Slope**	Low (flat)	**Geology**	Greywacke, sandstone and shale
Client	PDM	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	High (70 - 100%)
Stream Order	1st	**Velocity**	Fast	**Animal Access**	Sheep upstream
GPS Co-ordinates	N 98233 22218	**Modifications**	None	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	85	**pH**	6.47	**Temperature (°C)**	8.2
Dissolved Oxygen (mg/L)	9.69	**Conductivity (µS/cm)**	127	**Comment**	Clear and colourless, no odour

Species Information					
Ephemeroptera:		**Plecoptera:**		**Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	2	Hydropsychidae Ab	0
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	1
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	0
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	1
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	1	**Total no. of taxa**	2
Total Relative Abundance	0	**Total Relative Abundance**	2	**Total Relative Abundance**	2
G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	0	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	0	Group 2 Index Score*	4
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	2
Ancylus (G) Ab	0	Other GOLD Ab	0	Group 4 Index Score*	0
Physa (G) Ab	0	**Total no. of taxa**	3	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	7	**Total Index Score**	8
Eiseniella (Ol) Ab	0	***Asellus*:**		**Average Index Score**	1.6
Tubificidae (Ol) Ab	2	Few/Low	2	**SSRS Score**	**3.2**
Chironomidae (D) Ab	3	Common/Numerous	-		
Chironomus (D) Ab	2	Absent	-	**Stream at risk**	
Simuliidae (D) Ab	0				

Site Photograph

Comment:

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:

1-5 = 1	51-100 = 4
6-20 = 2	101+ = 5
21-50 = 3	

General Information					
Sample Location	SW202	**Bank Width (m)**	1	**Substratum Condition**	Normal
Site Location	Kill, Co. Kildare	**Wet Width (m)**	0.5	**Degree of Siltation**	Slight
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.1 - 0.2	**Depth of Mud (m)**	0.01 - 0.05
Survey Date	16/02/2015	**Slope**	Low (flat)	**Geology**	Greywacke, sandstone and shale
Client	Saint Gobain	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	High (70 - 100%)
Stream Order	1st	**Velocity**	Moderate	**Animal Access**	Sheep upstream
GPS Co-ordinates	N 98146 22391	**Modifications**	None	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	90	**pH**	7.27	**Temperature (°C)**	5.6
Dissolved Oxygen (mg/L)	10.95	**Conductivity (µS/cm)**	281	**Comment**	Clear and colourless, no odour

Species Information					
Ephemeroptera:		**Plecoptera:**		**Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	0	Hydropsychidae Ab	0
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	9
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	0
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	2
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	0	**Total no. of taxa**	2
Total Relative Abundance	0	**Total Relative Abundance**	0	**Total Relative Abundance**	11
G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	0	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	1	Group 2 Index Score*	0
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	4
Ancylus (G) Ab	0	Other GOLD Ab	4	Group 4 Index Score*	0
Physa (G) Ab	0	**Total no. of taxa**	4	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	11	**Total Index Score**	6
Eiseniella (Ol) Ab	0	***Asellus*:**		**Average Index Score**	1.2
Tubificidae (Ol) Ab	0	Few/Low	2	**SSRS Score**	**2.4**
Chironomidae (D) Ab	3	Common/Numerous	-	**Stream at risk**	
Chironomus (D) Ab	3	Absent	-		
Simuliidae (D) Ab	0				

Site Photograph

Comment:

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:
1-5 = 1
6-20 = 2
21-50 = 3
51-100 = 4
101+ = 5

General Information					
Sample Location	SW204	**Bank Width (m)**	2.5	**Substratum Condition**	Normal
Site Location	Kill, Co. Kildare	**Wet Width (m)**	0.5 - 1.0	**Degree of Siltation**	Slight
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.15 - 0.25	**Depth of Mud (m)**	0.01 - 0.05
Survey Date	16/02/2015	**Slope**	Low (flat)	**Geology**	Greywacke, sandstone and shale
Client	Saint Gobain	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	Moderate (30 - 70%)
Stream Order	1st	**Velocity**	Fast	**Animal Access**	Sheep upstream
GPS Co-ordinates	N 97428 22337	**Modifications**	Pipe culverts	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	93	**pH**	8.05	**Temperature (°C)**	5.6
Dissolved Oxygen (mg/L)	11.35	**Conductivity (µS/cm)**	337	**Comment**	Clear and colourless, no odour

Species Information					
Ephemeroptera:		**Plecoptera:**		**Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	0	Hydropsychidae Ab	1
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	0
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	1
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	2
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	0	**Total no. of taxa**	3
Total Relative Abundance	0	**Total Relative Abundance**	0	**Total Relative Abundance**	4
G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	2	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	0	Group 2 Index Score*	0
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	4
Ancylus (G) Ab	0	Other GOLD Ab	0	Group 4 Index Score*	0
Physa (G) Ab	0	**Total no. of taxa**	3	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	9	**Total Index Score**	6
Eiseniella (Ol) Ab	0	***Asellus*:**		**Average Index Score**	1.2
Tubificidae (Ol) Ab	0	Few/Low	1	**SSRS Score**	**2.4**
Chironomidae (D) Ab	4	Common/Numerous	-		
Chironomus (D) Ab	3	Absent	-	**Stream at risk**	
Simuliidae (D) Ab	0				

Site Photograph

Comment:
Stream sample taken upstream of confluence on RHS. Smaller stream/drainage ditch entering from LHS.

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:
1-5 = 1
6-20 = 2
21-50 = 3
51-100 = 4
101+ = 5

General Information					
Sample Location	SW207	**Bank Width (m)**	3	**Substratum Condition**	Normal
Site Location	Kill, Co. Kildare	**Wet Width (m)**	1.5 - 2.0	**Degree of Siltation**	Moderate
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.1 - 0.4	**Depth of Mud (m)**	0.05 - 0.2
Survey Date	16/02/2015	**Slope**	Low (flat)	**Geology**	Greywacke, sandstone and shale
Client	Saint Gobain	**Water Clarity**	Highly turbid	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	Moderate (30 - 70%)
Stream Order	1st	**Velocity**	Moderate	**Animal Access**	Sheep upstream & downstream
GPS Co-ordinates	N 96997 23023	**Modifications**	Pipe culverts	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	88	**pH**	7.37	**Temperature (°C)**	5.6
Dissolved Oxygen (mg/L)	10.7	**Conductivity (µS/cm)**	419	**Comment**	Clear and colourless, no odour

Species Information					
Ephemeroptera:		**Plecoptera:**		**Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	0	Hydropsychidae Ab	0
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	2
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	0
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	1
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	0	**Total no. of taxa**	2
Total Relative Abundance	0	**Total Relative Abundance**	0	**Total Relative Abundance**	3
G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	1	*Dicranota* (D) Ab	0	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	1	Group 2 Index Score*	0
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	4
Ancylus (G) Ab	0	Other GOLD Ab	0	Group 4 Index Score*	0
Physa (G) Ab	0	**Total no. of taxa**	4	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	7	**Total Index Score**	6
Eiseniella (Ol) Ab	0	***Asellus*:**		**Average Index Score**	1.2
Tubificidae (Ol) Ab	0	Few/Low	1	**SSRS Score**	**2.4**
Chironomidae (D) Ab	3	Common/Numerous	-	**Stream at risk**	
Chironomus (D) Ab	2	Absent	-		
Simuliidae (D) Ab	0				

Site Photograph

Comment:
Heavy siltation immediately downstream of culvert pipe, several meters upstream of sample location.

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

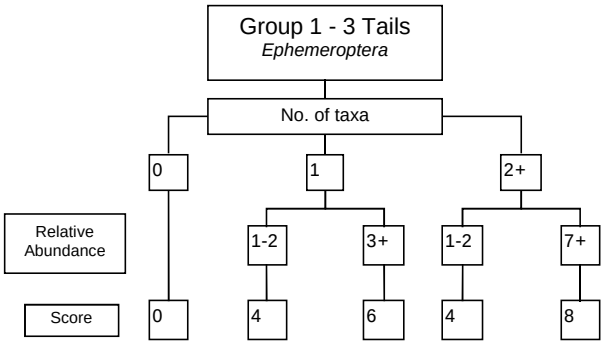
Relative Abundance:
1-5 = 1
6-20 = 2
21-50 = 3
51-100 = 4
101+ = 5

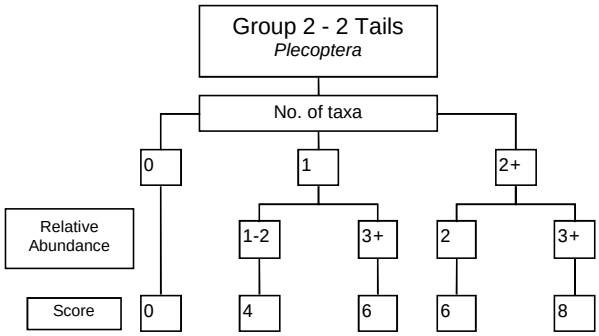
Location Reference	EPA Indicator Group	BMWP Score	Upstream		Downstream	
			SW203	SW202	SW204	SW207
Sampling Date			16-Feb-15	16-Feb-15	16-Feb-15	16-Feb-15
Mayflies (Ephemeroptera)						
Heptageneidae	A	10				
Ephemeridae	A	10				
Siphlonuridae	A	10				
Leptophlebidae	B	10				
Ephemerellidae	C	10				
Caenidae	C	7				
Baetidae	B	4			36	25
*Baetis Rhodani***	C	4				
Stoneflies (Plecoptera)						
Perlidae	A	10				
Perlodidae	A	10				
Nemouridae	A	7	9			
Leuctridae	B	10				
Caddis flies (Trichoptera)						
Cased						
Sericostomatidae	B	10	1	2	9	4
Goeridae	B	10				
Limnephilidae	B	7			1	
Glossosomatidae	B	-				
Lepidostomatidae	B	10				
Caseless						
Hydropsychidae	C	5			2	
Philopotamidae	C	-				
Polycentropodidae	C	7	1	9		13
Rhyacophilidae	C	7				
Beetles (Coleoptera)						
Elmidae	C	5	16	88	6	
Dytiscidae	C	5		1	1	
Flatworms (Platyhelminthes)						
Planariidae	C	5				
Crenobia alpina	C	5				
Dendrocoelidae	C	5				
Crustaceans (Crustacae)						
Gammaridae	C	6	22	113	35	69
Asellidae	D	3	8	7	2	3
True flies (Diptera)						
Simuliidae	C	5			64	
Pediciidae	-	-				
Dicronata	-	-		91	20	
Tipulidae	C	5		2		
Chironomidae	C	2	27	45	92	40
*Chironomus spp.***	E	2	16	32	30	14
Syrphidae	E	-				
Eristalis	E	-				
Mites (Hydracarina)						
Hydracarina	C	-				3
Snails & Limpets (Gastropoda)						
Ancylidae	C	6				
Hydrobiidae	C	3				1
Bithynia tentaculata	C	3				
Planorbidae	C	3				
Lymnaeidae	C	3				1
*Lymnaea peregra***	D	3				
Physidae	D	3				
Mussels (Bivalvia)						
Sphaeridae	D	3				
Leeches (Hirudinae)						
Piscicolidae	C	4				
Glossiphoniidae	D	3			1	
Erpobdellidae	D	3	2	1	3	4
Worms (Oligochaeta)						
Tubificidae	E	1	20		7	2
Lumbriculus		1		1		
Stickleback (Gasterosteidae)						
Gasterosteus aculeatus						
Number of individuals			122	392	309	179
Number of types of taxa			9	11	14	11
Q-value			**Q3**	**Q3**	**Q3**	**Q3**
BMWP			46	49	61	44
ASPT			5.1	4.5	4.4	4.0
Shannon Diversity Index			0.86	0.76	0.88	0.77

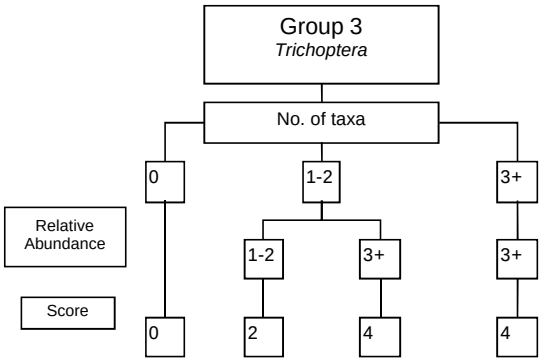
Note:
BMWP = Biological Monitoring Working Party score
ASPT = Average Score Per Taxa
Q-value with suffix '0' indicates toxic effect from contamination
*** indicates evidence of contamination**
**Species level of identification

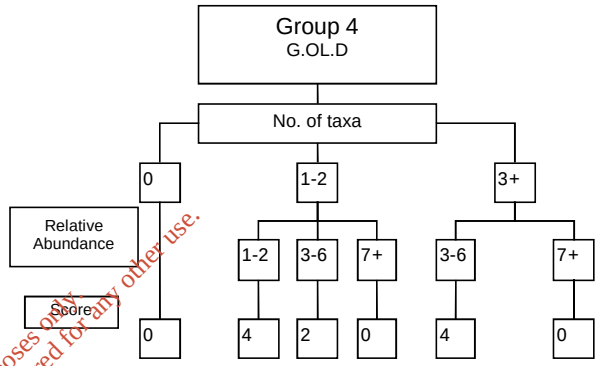
Index Score Calculation Sheet

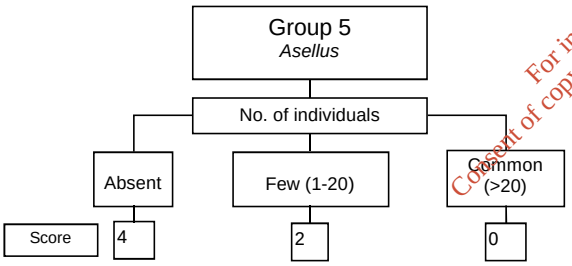
Calculate the index score by following the flow diagrams for each group depicted below.











Scoring:	
Group 1 Index Score	
Group 2 Index Score	
Group 3 Index Score	
Group 4 Index Score	
Group 5 Index	

General Information					
Sample Location	SW203	**Bank Width (m)**	2	**Substratum Condition**	Compact
Site Location	Kill, Co. Kildare	**Wet Width (m)**	0.5	**Degree of Siltation**	Moderate
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.1 - 0.2	**Depth of Mud (m)**	0.05 - 0.1
Survey Date	07/05/2015	**Slope**	Low (flat)	**Geology**	Volcanic
Client	PDM	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	High (70 - 100%)
Stream Order	1st	**Velocity**	Fast	**Animal Access**	Sheep with immediate access
GPS Co-ordinates	N 98233 22218	**Modifications**	None	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	82	**pH**	6.26	**Temperature (°C)**	9.1
Dissolved Oxygen (mg/L)	9.15	**Conductivity (µS/cm)**	128	**Comment**	Clear and colourless, no odour

Species Information					
Group 1 Ephemeroptera:		**Group 2 Plecoptera:**		**Group 3 Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	1	Hydropsychidae Ab	0
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	0
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	0
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	0
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	1	**Total no. of taxa**	0
Total Relative Abundance	0	**Total Relative Abundance**	1	**Total Relative Abundance**	0
Group 4 G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	1	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	0	Group 2 Index Score*	4
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	1	Group 3 Index Score*	0
Ancylus (G) Ab	0	Other GOLD Ab	0	Group 4 Index Score*	0
Physa (G) Ab	0	**Total no. of taxa**	2	Group 5 Index Score*	0
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	7	**Total Index Score**	4
Eiseniella (Ol) Ab	0	**Group 5 Asellus:**		**Average Index Score**	0.8
Tubificidae (Ol) Ab	2	Few/Low	-	**SSRS Score**	**1.6**
Chironomidae (D) Ab	3	Common/Numerous	-		
Chironomus (D) Ab	0	Absent	-	**Stream at risk**	
Simuliidae (D) Ab	0				

Site Photograph

Comment:

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:

1-5 = 1	51-100 = 4
6-20 = 2	101+ = 5
21-50 = 3	

General Information					
Sample Location	SW202	**Bank Width (m)**	1	**Substratum Condition**	Normal
Site Location	Kill, Co. Kildare	**Wet Width (m)**	0.5	**Degree of Siltation**	Slight
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.1 - 0.2	**Depth of Mud (m)**	0.01 - 0.05
Survey Date	07/05/2015	**Slope**	Low (flat)	**Geology**	Volcanic
Client	Saint Gobain	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	High (70 - 100%)
Stream Order	1st	**Velocity**	Moderate	**Animal Access**	Sheep upstream
GPS Co-ordinates	N 98146 22391	**Modifications**	None	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	96	**pH**	7.44	**Temperature (°C)**	9.6
Dissolved Oxygen (mg/L)	10.6	**Conductivity (µS/cm)**	102	**Comment**	Clear and colourless, no odour

Species Information					
Group 1 Ephemeroptera:		**Group 2 Plecoptera:**		**Group 3 Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	0	Hydropsychidae Ab	0
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	2
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	1
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	3
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	0	**Total no. of taxa**	3
Total Relative Abundance	0	**Total Relative Abundance**	0	**Total Relative Abundance**	6
Group 4 G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	3	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	1	Group 2 Index Score*	0
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	4
Ancylus (G) Ab	0	Other GOLD Ab	0	Group 4 Index Score*	4
Physa (G) Ab	0	**Total no. of taxa**	4	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	6	**Total Index Score**	10
Eiseniella (Ol) Ab	0	**Group 5 Asellus:**		**Average Index Score**	2
Tubificidae (Ol) Ab	1	Few/Low	1	**SSRS Score**	**4**
Chironomidae (D) Ab	1	Common/Numerous	-		
Chironomus (D) Ab	0	Absent	-	**Stream at risk**	
Simuliidae (D) Ab	0				

Site Photograph

Comment:

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:

1-5 = 1	51-100 = 4
6-20 = 2	101+ = 5
21-50 = 3	

General Information					
Sample Location	SW204	**Bank Width (m)**	2.5	**Substratum Condition**	Normal
Site Location	Kill, Co. Kildare	**Wet Width (m)**	0.5 - 1.0	**Degree of Siltation**	Slight
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.15 - 0.25	**Depth of Mud (m)**	0.01 - 0.05
Survey Date	07/05/2015	**Slope**	Low (flat)	**Geology**	Volcanic
Client	Saint Gobain	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	Moderate (30 - 70%)
Stream Order	1st	**Velocity**	Fast	**Animal Access**	Sheep upstream
GPS Co-ordinates	N 97428 22337	**Modifications**	Pipe culverts	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	95	**pH**	7.94	**Temperature (°C)**	10.1
Dissolved Oxygen (mg/L)	10.5	**Conductivity (µS/cm)**	214	**Comment**	Clear and colourless, no odour.
Species Information					
Group 1 Ephemeroptera:		**Group 2 Plecoptera:**		**Group 3 Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	0	Hydropsychidae Ab	1
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	0
Heptagenia Ab	1	*Isoperla* Ab	0	*Rhyacophila* Ab	1
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	1
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	3
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	1	**Total no. of taxa**	0	**Total no. of taxa**	4
Total Relative Abundance	1	**Total Relative Abundance**	0	**Total Relative Abundance**	6
Group 4 G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	1	Group 1 Index Score*	4
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	0	Group 2 Index Score*	0
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	4
Ancylus (G) Ab	0	Other GOLD Ab	0	Group 4 Index Score*	4
Physa (G) Ab	0	**Total no. of taxa**	5	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	5	**Total Index Score**	14
Eiseniella (Ol) Ab	0	**Group 5 Asellus:**		**Average Index Score**	2.8
Tubificidae (Ol) Ab	1	Few/Low	1	**SSRS Score**	**5.6**
Chironomidae (D) Ab	1	Common/Numerous	-		
Chironomus (D) Ab	1	Absent	-	**Stream at risk**	
Simuliidae (D) Ab	1				

Site Photograph

Comment:
Stream sample taken upstream of confluence on RHS. Smaller stream/drainage ditch entering from LHS.

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:
1-5 = 1
6-20 = 2
21-50 = 3
51-100 = 4
101+ = 5

General Information					
Sample Location	SW207	**Bank Width (m)**	3	**Substratum Condition**	Normal
Site Location	Kill, Co. Kildare	**Wet Width (m)**	1.5 - 2.0	**Degree of Siltation**	Moderate
Surveyor(s)	David Horgan	**Avg Depth (m)**	0.1 - 0.4	**Depth of Mud (m)**	0.05 - 0.2
Survey Date	07/05/2015	**Slope**	Low (flat)	**Geology**	Volcanic
Client	Saint Gobain	**Water Clarity**	Clear	**Main Land Use**	Pasture
River/Stream Name	Unknown	**Discharge**	Normal	**Shading**	Moderate (30 - 70%)
Stream Order	1st	**Velocity**	Moderate	**Animal Access**	Sheep upstream & downstream
GPS Co-ordinates	N 96997 23023	**Modifications**	Pipe culverts	**Sewage Fungus**	None
Stream Flow	Riffle	**Dominant Substratum**	Gravels	**Filamentous Algae**	None
Water Quality Measurements					
Dissolved Oxygen (%)	91	**pH**	7.15	**Temperature (°C)**	10.3
Dissolved Oxygen (mg/L)	9.93	**Conductivity (µS/cm)**	325	**Comment**	Clear and colourless, no odour
Species Information					
Group 1 Ephemeroptera:		**Group 2 Plecoptera:**		**Group 3 Trichoptera:**	
Ecdyonurus Ab	0	Nemouridae Ab	0	Hydropsychidae Ab	1
Rhithrogena Ab	0	*Leuctra* Ab	0	Polycentropodidae Ab	2
Heptagenia Ab	0	*Isoperla* Ab	0	*Rhyacophila* Ab	0
Ephemerella Ab	0	*Protonemura* Ab	0	Philopotamidae Ab	0
Caenis Ab	0	*Amphinemura* Ab	0	Limnephilidae Ab	0
Paraleptophlebia Ab	0	*Perla* Ab	0	Sericostomatidae Ab	1
Ephemera danica Ab	0	*Dinocras* Ab	0	Glossosomatidae Ab	0
Other Ephem Ab	0	Other Plecop Ab	0	Lepidostomatidae Ab	0
				Other Trichoptera Ab	0
Total no. of taxa	0	**Total no. of taxa**	0	**Total no. of taxa**	3
Total Relative Abundance	0	**Total Relative Abundance**	0	**Total Relative Abundance**	4
Group 4 G.OL.D:				**Scoring:**	
Lymnaea (G) Ab	0	*Dicranota* (D) Ab	2	Group 1 Index Score*	0
Potamopyrgus (G) Ab	0	Tipulidae (D) Ab	0	Group 2 Index Score*	0
Planorbis (G) Ab	0	Ceratopogonidae (D) Ab	0	Group 3 Index Score*	4
Ancylus (G) Ab	0	Other GOLD Ab	1	Group 4 Index Score*	0
Physa (G) Ab	0	**Total no. of taxa**	3	Group 5 Index Score*	2
Lumbriculus (Ol) Ab	0	**Total Relative Abundance**	7	**Total Index Score**	6
Eiseniella (Ol) Ab	0	**Group 5 Asellus:**		**Average Index Score**	1.2
Tubificidae (Ol) Ab	2	Few/Low	1	**SSRS Score**	**2.4**
Chironomidae (D) Ab	1	Common/Numerous	-		
Chironomus (D) Ab	1	Absent	-	**Stream at risk**	
Simuliidae (D) Ab	0				

Site Photograph

Comment:
Heavy siltation immediately downstream of culvert pipe, several meters upstream of sample location.

Notes: Please refer to Index Score Calculation Sheet
SSRS Score **>7.25** = Probably not at risk
SSRS Score **>6.5 - 7.25** = Intermediate, stream may be at risk
SSRS Score **<6.5** = Stream at risk

Relative Abundance:
1-5 = 1
6-20 = 2
21-50 = 3
51-100 = 4
101+ = 5

Location Reference	EPA Indicator Group	BMWP Score	Upstream		Downstream	
			SW203	SW202	SW204	SW207
Sampling Date			07-May-15	07-May-15	07-May-15	07-May-15
Mayflies (Ephemeroptera)						
Heptageneidae	A	10			3	
Ephemeridae	A	10				
Siphlonuridae	A	10				
Leptophlebidae	B	10				
Ephemerellidae	C	10				
Caenidae	C	7				
Baetidae	B	4		1	26	52
*Baetis Rhodani***	C	4				
Stoneflies (Plecoptera)						
Perlidae	A	10				
Perlodidae	A	10				
Nemouridae	A	7	1			
Leuctridae	B	10				
Caddis flies (Trichoptera)						
Cased						
Sericostomatidae	B	10		23	21	3
Goeridae	B	10				
Limnephilidae	B	7		2	4	
Glossosomatidae	B	-				
Lepidostomatidae	B	10				
Caseless						
Hydropsychidae	C	5			2	2
Philopotamidae	C	-				
Polycentropodidae	C	7		13		7
Rhyacophilidae	C	7			1	
Beetles (Coleoptera)						
Elmidae	C	5	1	43	16	
Dytiscidae	C	5	1	2		
Flatworms (Platyhelminthes)						
Planariidae	C	5				
Crenobia alpina	C	5				
Dendrocoelidae	C	5				
Crustaceans (Crustacae)						
Gammaridae	C	6		223	78	408
Asellidae	D	3		4	2	
True flies (Diptera)						
Simuliidae	C	5			4	
Pediciidae	-	-				
Dicronata	-		1	40	3	6
Tipulidae	C	5		1		
Chironomidae	C	2	22	3	3	3
*Chironomus spp.***	E	2			5	1
Syrphidae	E	-				
Eristalis	E	-				
Mites (Hydracarina)						
Hydracarina	C	-				
Snails & Limpets (Gastropoda)						
Ancylidae	C	6				
Hydrobiidae	C	3				1
Bithynia tentaculata	C	3				
Planorbidae	C	3				
Lymnaeidae	C	3				
*Lymnaea peregra***	D	3				
Physidae	D	3				
Mussels (Bivalvia)						
Sphaeridae	D	3				
Leeches (Hirudinae)						
Piscicolidae	C	4				
Glossiphoniidae	D	3		1		2
Erpobdellidae	D	3	4	2	1	
Worms (Oligochaeta)						
Tubificidae	E	1	16	2	5	6
Lumbriculus	-	1				
Stickleback (Gasterosteidae)						
Gasterosteus aculeatus						
Number of individuals			46	360	174	491
Number of types of taxa			7	14	15	11

Q-value	Q3	Q3	Q3-4	Q3

BMWP	23	61	70	43
ASPT	3.3	4.4	4.7	3.9
Shannon Diversity Index	0.55	0.58	0.81	0.30

Note:

BMWP = Biological Monitoring Working Party score
ASPT = Average Score Per Taxa
Q-value with suffix '0' indicates toxic effect from contamination
*** indicates evidence of contamination**
**Species level of identification

APPENDIX B – CERTIFICATES OF ANALYSIS

Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

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AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland

4225

Attention :	David Mullan
Date :	17th June, 2016
Your reference :	
Our reference :	Test Report 16/10100 Batch 1 Schedule B
Location :	PDM
Date samples received :	10th June, 2016
Status :	Final report
Issue :	1

Sixteen samples were received for analysis on 10th June, 2016 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan
JE Job No.: 16/10100

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	6	7	8	9	10	11	12	13	14	15	LOD/LOR	Units	Method No.
Sample ID	SS531	SS530	SS529	SS528	SS527	SS516	SS515	SS514	SS513	SS520			
Depth	0-0.03	0.05	0-06	0-003	0-0.03	0-02	0.01	0.11	0.03	0-0.05			
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	10/06/2016	10/06/2016	10/06/2016	10/06/2016	10/06/2016	10/06/2016	10/06/2016	10/06/2016	10/06/2016	10/06/2016			
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	0.85	0.09	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.31	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.39	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	0.77	0.04	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	0.11	<0.04	<0.04	<0.04	<0.04	1.62	0.17	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	0.15	<0.03	0.04	0.03	0.05	1.97	0.20	0.04	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	0.11	<0.03	<0.03	<0.03	0.04	1.50	0.16	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.35	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	0.42	0.04	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.54	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.15	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.35	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.27	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	9.5	0.7	<0.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.39	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.15	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106	109	105	111	111	106	104	104	105	103	<0	%	TM4/PM8
Natural Moisture Content	36.7	19.5	39.6	23.3	23.0	7.7	26.6	285.5	45.8	29.2	<0.1	%	PM4/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan
JE Job No.: 16/10100

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	16										Please see attached notes for all abbreviations and acronyms		
Sample ID	SS519												
Depth	0.202												
COC No / misc													
Containers	J												
Sample Date	09/06/2016												
Sample Type	Soil												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	10/06/2016												
PAH MS													
Naphthalene #	<0.04										<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.20										<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05										<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04										<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.14										<0.03	mg/kg	TM4/PM8
Anthracene #	0.38										<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.27										<0.03	mg/kg	TM4/PM8
Pyrene #	0.24										<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06										<0.06	mg/kg	TM4/PM8
Chrysene #	0.10										<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07										<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04										<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.3										<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05										<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02										<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	98										<0	%	TM4/PM8
Natural Moisture Content	241.3										<0.1	%	PM4/PM0

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 16/10100						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 16/10100

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 16/10100

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

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AECOM
4th Floor Adelphi Plaza
Adelphi Centre
Georges Street Upper
Dun Laoghaire, Co Dublin
Ireland

4225

Attention :	David Mullan
Date :	20th June, 2016
Your reference :	
Our reference :	Test Report 16/10244 Batch 1
Location :	PDM
Date samples received :	14th June, 2016
Status :	Final report
Issue :	1

Twenty one samples were received for analysis on 14th June, 2016 of which twenty one were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Paul Lee-Boden BSc
Project Manager

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan
JE Job No.: 16/10244

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	4	5	6	7	8	9	10	LOD/LOR	Units	Method No.
Sample ID	SS521	SS522	SS523	SS524	SS525	SS526	SS517	SS518	DUP01	SS501			
Depth	0.10	0.15	0.12		0.04					0.70			
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016			
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.23	0.72	0.16	<0.03	<0.03	0.08	0.41	0.33	4.39	4.41	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	4.46	1.19	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.22	<0.04	<0.04	<0.04	<0.04	0.20	0.13	4.52	1.49	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.16	0.32	0.12	<0.03	<0.03	0.11	0.41	0.23	6.41	5.86	<0.03	mg/kg	TM4/PM8
Anthracene #	0.49	1.31	0.32	0.07	0.05	0.14	0.81	0.63	9.30	9.66	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.51	1.24	0.32	0.05	0.03	0.30	1.17	0.46	10.77	14.34	<0.03	mg/kg	TM4/PM8
Pyrene #	0.47	1.24	0.30	0.05	0.05	0.30	0.91	0.46	6.57	8.97	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.23	0.22	<0.06	<0.06	<0.06	0.09	<0.06	<0.06	1.06	0.77	<0.06	mg/kg	TM4/PM8
Chrysene #	0.30	0.40	0.12	0.03	0.02	0.16	0.25	0.13	2.60	2.30	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.54	0.64	0.22	<0.07	<0.07	0.23	<0.07	<0.07	6.57	4.52	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.26	0.25	0.08	<0.04	<0.04	0.12	<0.04	<0.04	2.79	1.46	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.28	0.32	0.10	<0.04	<0.04	0.09	<0.04	<0.04	2.05	1.26	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.42	0.27	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.35	0.32	0.10	<0.04	<0.04	0.11	<0.04	<0.04	1.86	1.15	<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.8	7.4	1.8	<0.6	<0.6	1.7	4.2	2.4	63.8	57.7	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.39	0.46	0.16	<0.05	<0.05	0.17	<0.05	<0.05	4.73	3.25	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.15	0.18	0.06	<0.02	<0.02	0.06	<0.02	<0.02	1.84	1.27	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	99	103	104	99	103	88	86	92	91	<0	%	TM4/PM8
Natural Moisture Content	74.2	147.6	98.2	69.0	16.0	56.0	407.0	231.3	220.6	283.3	<0.1	%	PM4/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan
JE Job No.: 16/10244

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	11	12	13	14	15	16	17	18	19	20	LOD/LOR	Units	Method No.
Sample ID	SS502	SS503	SS504	SS505	SS506	SS507	SS508	SS509	SS510	SS511			
Depth	0.70	0.60	0.09	0.60	0.40	0.40	0.25	0.19	0.18	0.56			
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016	09/06/2016			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016	14/06/2016			
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	5.69	3.64	2.25	6.14	4.86	3.04	3.63	3.31	1.46	0.48	<0.03	mg/kg	TM4/PM8
Acenaphthene #	3.92	1.64	0.90	2.09	3.49	1.41	0.94	1.08	5.26	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	4.10	2.11	1.30	2.27	3.26	1.36	1.35	1.39	9.76	0.13	<0.04	mg/kg	TM4/PM8
Phenanthrene #	4.79	4.07	2.30	3.87	4.86	2.55	2.16	2.05	23.96	0.22	<0.03	mg/kg	TM4/PM8
Anthracene #	12.81	6.87	3.85	10.14	9.10	5.22	6.77	5.91	21.62	0.83	<0.04	mg/kg	TM4/PM8
Fluoranthene #	12.68	13.63	4.80	14.80	9.96	8.48	7.91	6.09	74.45$_{AA}$	0.53	<0.03	mg/kg	TM4/PM8
Pyrene #	8.45	8.93	4.00	9.58	6.64	6.25	4.93	4.64	50.67$_{AA}$	0.45	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	2.07	0.74	0.40	0.98	0.74	0.54	0.77	0.48	10.81	0.10	<0.06	mg/kg	TM4/PM8
Chrysene #	7.20	1.58	0.80	2.03	1.49	1.20	1.06	1.08	12.10	0.11	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	15.74	1.64	0.90	2.15	3.03	1.41	1.04	1.27	8.35	0.26	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	5.39	0.58	0.35	0.74	1.14	0.49	0.82	0.48	3.57	0.10	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	3.19	0.58	0.35	0.68	0.86	0.49	0.69	0.48	1.12	0.14	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.60	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.32	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	2.98	0.53	0.30	0.74	0.92	0.43	0.61	0.42	0.95	0.11	<0.04	mg/kg	TM4/PM8
PAH 16 Total	89.6	46.5	22.5	56.2	50.4	32.9	33.7	28.7	224.4	3.5	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	11.33	1.18	0.65	1.55	2.18	1.02	1.47	0.91	6.01	0.19	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	4.41	0.46	0.25	0.60	0.85	0.39	0.57	0.36	2.34	0.07	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	89	95	95	106	87	88	87	90	95	108	<0	%	TM4/PM8
Natural Moisture Content	331.3	428.2	400.0	514.3	472.2	443.6	307.7	502.7	41.3	60.0	<0.1	%	PM4/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan
JE Job No.: 16/10244

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	21												
Sample ID	SS512												
Depth	0.60										Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	J												
Sample Date	09/06/2016												
Sample Type	Soil												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	14/06/2016												
PAH MS													
Naphthalene #	<0.04										<0.04	mg/kg	TM4/PM8
Acenaphthylene	1.93										<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.64										<0.05	mg/kg	TM4/PM8
Fluorene #	0.87										<0.04	mg/kg	TM4/PM8
Phenanthrene #	1.65										<0.03	mg/kg	TM4/PM8
Anthracene #	3.17										<0.04	mg/kg	TM4/PM8
Fluoranthene #	5.74										<0.03	mg/kg	TM4/PM8
Pyrene #	4.04										<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.73										<0.06	mg/kg	TM4/PM8
Chrysene #	0.96										<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	1.29										<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.51										<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.51										<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.37										<0.04	mg/kg	TM4/PM8
PAH 16 Total	22.4										<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.93										<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.36										<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	93										<0	%	TM4/PM8
Natural Moisture Content	359.2										<0.1	%	PM4/PM0

Client Name: AECOM
Reference:
Location: PDM
Contact: David Mullan

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 16/10244						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 16/10244

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

JE Job No: 16/10244

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

ABOUT AECOM

In a complex and unpredictable world, where growing demands have to be met with finite resources, AECOM brings experience gained from improving quality of life in hundreds of places.

We bring together economists, planners, engineers, designers and project managers to work on projects at every scale. We engineer energy efficient buildings and we build new links between cities. We design new communities and regenerate existing ones. We are the first whole environments business, going beyond buildings and infrastructure.

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