East Anglia ONE
Offshore Windfarm

East Anglia ONE Offshore Windfarm

Written Scheme of Potentially Contaminated Land Mitigation DCO Requirement 17 Final for Discharge

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REVISION CONTROL

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Abbreviations

AC – Alternating Current
BH - Borehole
CEC – Cation Exchange Capacity
CfD – Contract for Difference
DC – Direct Current
DCO – Development Consent Order
DECC – Department for Energy and Climate Change
EAOL – East Anglia One Limited
ES – Environmental Statement
EQS – Environmental Quality Standard
HVAC – High Voltage Alternating Current
HVDC – High Voltage Direct Current
LPA – Local Planning Authority
MW – Megawatts
PAHs – Polyaromatic Aromatic Hydrocarbons
SPR – ScottishPower Renewables
sVOCs – Semi Volatile Organic Compounds
TOC – Total Organic Carbon
TP – Trial Pit
WAC – Waste Acceptance Criteria

1 Introduction

1.1 Project Overview

1. East Anglia ONE Limited (EAOL) was awarded a Development Consent Order (DCO) by the Secretary of State, Department of Energy and Climate Change (DECC) on June 17th 2014 for East Anglia ONE Offshore Wind Farm (EA ONE). The DCO granted consent for the development of a 1200MW offshore windfarm and associated infrastructure.

2. In February 2015 EAOL secured a Contract for Difference (CfD) award to build a 714MW project and Scottish Power Renewables announced its role in leading East Anglia ONE towards construction. In April 2015 EAOL submitted a non-material change application to DECC to amend the consent from direct current (DC) technology to alternating current (AC). In March 2016 DECC authorised the proposed change application and issued a Correction and Amendments Order.

3. This plan relates to the onshore construction works associated with EA ONE, which based on the AC technology with a capacity of 714MW and transmission connection of 680MW, comprises of;

- A landfall site at Bawdsey, Suffolk
- Up to six underground cables, approx. 37km in length
- Up to eight cable ducts for two future East Anglia projects
- An onshore substation located at Bramford next to existing National Grid infrastructure

1.2 Purpose and Scope

4. This Written Scheme of Contaminated Land Mitigation provides details of the site investigation and assessment, which have been undertaken to identify the extent of any contaminated land and identify any appropriate mitigation measures. This plan has been produced to fulfil DCO Requirement 17 parts (1) and (2) which states:

> **17.**—(1) No *connection works comprised in stage (vii) shall commence until a written scheme applicable to that stage, to mitigate the potential for release of contaminants within the Order limits has, after consultation with the Environment Agency, been submitted to and approved by the relevant planning authority.*
> *(2) The scheme must include an investigation and assessment report, prepared by a specialist consultant approved by the relevant planning authority, to identify the extent of any contamination within the Order limits comprised in stage (vii) and mitigation measures to be undertaken to limit impacts arising from the potential release of contaminants.*
> *(3) The written scheme referred to in sub-paragraph (1) must be implemented as approved.*

5. The scope of this Written Scheme of Mitigation is the identified potentially contaminated land within Stage (g) of the onshore cable route and includes interpretation of the site investigation data obtained.

1.3 Background

6. During the preparation of the Environmental Statement in 2012, (Volume 3 Onshore Impacts; 7.4.1 Chapter 20 – Ground Conditions and Contamination), locations of potential contamination concern were identified and preliminary risk assessments applied along the whole 37 km onshore route. A Phase 1 Desk Study was undertaken for the section of the onshore works identified as requiring further assessment. The Phase 1 Desk Study Report was issued in October 2015 (Ref No IEC-EHWF-1A8L-01-Rev0;) and should be read in conjunction with this report.

7. In the Environmental Statement, the potential contamination source of greatest concern for the entire onshore cable route was the historic landfill to the north of the village of Tuddenham St Martin. Tuddenham St Martin landfill is classified by Suffolk Coastal District Council as Contaminated Land under Part IIA of the Environmental Protection Act 1990; it has also been designated as a 'special site' on the basis of pollution of controlled waters and is now regularly monitored by the Environment Agency, the regulatory authority for controlled waters. Approximately 110m of the cable route passes through the landfill and the principal objective of the Phase 1 Desk Study was to further assess the risk of construction potentially remobilising existing contamination and impacting on the quality of groundwater and subsequently the River Fynn. At the time of the Environmental Statement, this historic landfill at Tuddenham St Martin, was identified as the only site where cable

route construction trenching would be required through either landfill, or infilled pits. However, the Phase 1 Desk Study identified that the route also passes though Culpho Hall Landfill, about which little is known.

8. At the Phase 1 Desk Study stage of investigation, the potential environmental risks at Tuddenham St Martin landfill were considered to be medium to high for the following pollutant linkages:

- Leaching of ammonia-N from soils on the site into controlled waters (groundwater) contained within the Red Crag aquifer (SPL 1: already identified in Remediation Statement by The Environment Agency)
- Leaching of ammonia-N from soils on the site and then migration via springs to controlled waters in the River Fynn (SPL 2: already identified in Remediation Statement by The Environment Agency)
- Inhalation, ingestion and dermal contact with the potentially contaminated soil source of Made Ground (landfill material) for the human receptor of cable route construction workers.

9. The Phase 1 Desk Study recommended that further Phase 2 intrusive investigation was required to assess the risk of construction potentially remobilising existing contamination and impacting on the quality of groundwater and subsequently the River Fynn.

10. The East Anglia One Environmental Statement in 2012, identified Culpho Hall landfill as a former sand pit from historic maps, but this was not been confirmed by the more targeted Desk Study preparation in 2015, when no evidence of a sand pit could be identified on the historic mapping. Following Desk Study preparation, significant uncertainty remained for this landfill. Based on the limited available information, the potential environmental risks associated with the proposed cable route construction were conservatively assessed in the Desk Study to be low, or low to medium.

11. Further intrusive Phase 2 investigations of both Tuddenham St Martin and Culpho Hall landfill areas, were commissioned by to characterise the landfill area and assess the risk of the proposed construction activities. The Phase 2 Investigation of the historic landfill to the north of the village of Tuddenham St Martin and Culpho Hall was completed by specialist contractors REC Limited in June 2016.

12. Factual Reports for the Phase 2 investigation completed at the Tuddenham St Martin and Culpho Hall sites were prepared by REC Limited and are included as Appendix 3 to this report.

1.4 Limitations

13. This document has been prepared for the title project and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of EAOL, being obtained.

14. EAOL accepts no responsibility or liability for the consequences of this document being used for a purpose other than the purpose for which it was commissioned. Any person using or relying on this document for such other purposes agrees, and will by such use or reliance be taken to confirm his agreement to indemnify EAOL for all loss or damage resulting therefrom.

15. The findings of the ground conditions are based on the information obtained from the desk study review. All reasonable skill, care and diligence have been exercised in completion of this report, within the timescales available. Notwithstanding the efforts made in carrying out this report, it is possible that other soil and groundwater conditions, as yet undetected, may exist, and this must be taken into account when relying on the findings of this report.

1.5 Proposed Development

16. The onshore cable route comprises a 37km corridor between the Suffolk coast at Bawdsey and the substation at Bramford, passing the northern side of Ipswich. The onshore cable works comprise the installation of electricity transmission cables and ducts between the landfall location at Bawdsey and the new substation station, which is adjacent to the existing substation at Bramford. The majority of the route will be constructed using open trenching methods, other than in certain locations where the cable route traverses a number of major transport networks and natural obstacles.

17. The open trenching will be the method used for the installation of the cables and ducts through the potentially contaminated land sites. This section provides a general description of this methodology, the specific methodology and mitigation measures as required for installation at the potentially contaminated sites are presented in Sections 9 and 10.

18. Construction activities will be undertaken within a temporarily fenced strip of land, referred to as the working width. The working width is determined by electrical and civil engineering considerations and allows for sufficient space between the cables trenches to prevent the cables overheating, plus space for the associated temporary construction works i.e. soil storage, drainage, haul road installation and work areas for personnel and machinery. In accordance with the DCO the working width shall not exceed 55m, where trenching methods are employed.

19. For the open trenching method two trenches will be excavated for the EA ONE ducts and cables and an additional trench will be excavated in parallel for the cable ducts that will be installed to serve EA THREE in the future. Figures 1 and 2 show a typical trench layout for EA ONE and EA THREE, respectively and are also presented in Appendix 4. As the trench excavation progresses, subsoil will be removed to create the trenches to working depth for duct installation, the subsoil will be temporarily stored separately from the topsoil.

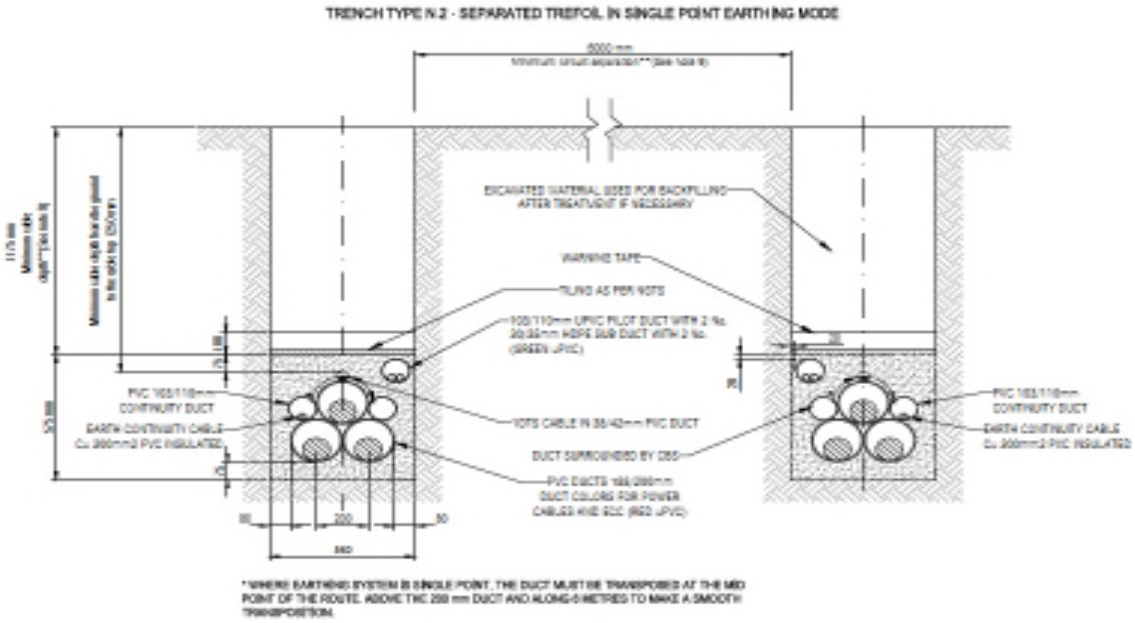

Figure 1 Typical Trench Layout for EA ONE

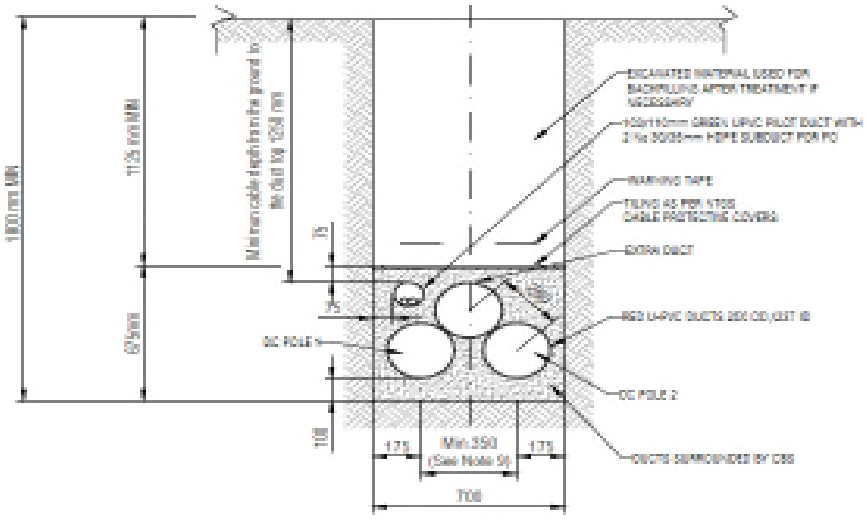

Figure 2 Typical Trench Layout for EA THREE

20. The ducts will be installed in the trench, where they will be bedded on and then surrounded and topped by Cement Bound Sand (CBS) or equivalent which will gradually set and harden in situ as water is absorbed. Above this, the subsoil will then be used to reinstate the trench to the previous level.

21. Once the cable duct installation is completed then works will commence on the installation of the EA ONE cables within the pre-installed ducting system. Further details on the construction methodology for the onshore cable route are presented in the Cable Method Statement (EA1-CON-R-IBR-021238).

2 Contaminated Land Sites

2.1 Context

22. The investigation was completed within two former landfill areas, which are to be crossed by the EA ONE Onshore Cable Route. They are approximately 1 kilometre apart and both located to the east of the village of Tuddenham St Martin, around 5 kilometres north of the centre of Ipswich.

- Tuddenham St Martin (TM)
- Culpho Hall (CH)

2.2 Tuddenham St Martin Landfill Description

23. This historic landfill is situated on the northern side of the village of Tuddenham St Martin, immediately to the east of Clopton Road. The whole landfill area is roughly rectangular in shape and occupies approximately 3 hectares, with maximum dimensions of around 300m, north to south and 130m, east to west. The National Grid Reference (NGR) for the centre of the site is TM 19334 49207. The cable route corridor (i.e. area of investigation), traverses through the northern half of the landfill for approximately 110m. The topography of the cable route is undulating, in places steep, with a potential fall in level of around 10m from east to west.

24. The current use of the area is open scrubland, overgrown with weeds and brambles in places, detritus including building rubble, and wire was frequently noted to be present at surface. To the north of the cable route corridor, a scarp form, apparently the edge of sand extraction which has not been infilled, is present. The landfill boundaries are well defined, formed by dense hedging and trees.

25. There is significant variation in topography across the landfill, the western site boundary along Clopton Road is about 10m below the eastern site boundary. The mounding of waste materials in the east and south of the landfill area is obvious and probably higher than the original ground profile prior to sand extraction. The landfill is at its highest along the eastern site boundary, which is at the same elevation as the adjacent fields.

26. To the north, east and south of the landfill, the land use is agricultural fields. To the west, beyond Clopton Road, the land is predominantly undeveloped with areas of meadow and woodland, but there are also a couple of widely spaced residential properties with gardens, ‘Gypsy Cottage’ being the closest, midway along the western site boundary and ‘Finnlands’ close to the southern site boundary.

27. The landfill is situated within the catchment area of the River Fynn, which flows in a southeasterley direction approximately 250m to the southwest. A number of ditches and springs are present between the landfill and river, which ultimately drain into the River Fynn. Surface water quality sampling, analysis and insitu testing within this area to the west of the landfill were included in the ground investigation scope.

28. The site is conservatively classified as ‘RED’ in accordance with Guidance for Safe Investigation of Potentially Contaminated Land, published by ICE Publishing Thomas Telford Ltd (2013). The majority of anticipated landfill deposits would allow the site to be classified as yellow. However during a previous investigation of the whole landfill (dating from 2000), several pieces of bonded asbestos materials (cement sheeting) were encountered. The potential presence of Asbestos within the waste materials to be investigated increases the site classification to RED.

2.3 Culpho Hall Landfill Description

29. Approximately 1 kilometre southeast Tuddenham St Martin Landfill, is an area identified as Culpho Hall Landfill, a Council registered Landfill immediately to the southeast of the residential dwelling, Culpho End. The actual position of this landfill is not clear with different sources providing two different, but overlapping locations. Either the landfill is contained within a triangular shaped field of around 1.3 Hectares which the cable route will pass through for approximately 325m, in a southwest to northeast orientation (from approximate NGR:TM 203 483 in the west, to TM206 485 in the east), or the landfill is within a square area immediately to the north, which is not defined by current field boundaries and overlaps into the triangular field. If the landfill is within this northern square area, adjacent to the road and will only encroach onto the cable route corridor for an area of around 0.35 Hectares, with maximum length of 100m, along the northern corridor boundary.

30. During the site walkover in July 2015, the fields of interest were in crop and very gently sloped to the south, there was no surface evidence that this area of ground had previously been disturbed. The southern triangular field can only be accessed across other fields and is not adjacent to a road, or track.

31. The site is classified as 'YELLOW' in accordance with Guidance for Safe Investigation of Potentially Contaminated Land, published by ICE Publishing Thomas Telford Ltd (2013).

3 Phase 1 Desk Study Review

3.1 Context

32. The following Sections 3.2 to 3.6 include relevant background information abstracted from the, E A One Offshore Windfarm Phase 1 Desk Study Report .2015 (Ref No IEC-EHWF-1A8L-01-Rev0;)

33. In the following sections, each of the two sites are considered separately.

3.2 Tuddenham St Martin Published Geology

34. The landfill area is recorded as 'infilled ground – artificial deposit', in the BGS Geoindex database. The infilling is shown to occupy the whole width of the linear Lowestoft Formation sand and gravel drift deposit, oriented parallel to the River Fynn and within around 300m of its eastern bank, which continues to be present to the north and south of the landfill where it has not been quarried.

35. The solid geology beneath this section generally comprises Red Crag Formation over London Clay, but, the landfill is notably within an area of Chillesford Church Sand Member, the whole width of this deposit having been formerly worked at this location. The Red Crag Formation is a Quaternary sediment generally comprising coarse grained, poorly sorted, cross bedded sand with shells. Typically this deposit is oxidised to yellow, or reddish brown with ferruginous concretions (iron pan). Rounded flint pebbles form a basal bed for this deposit. The Chillesford Sand Member is a subdivision of the Crag Group deposits, only able to be mapped separately from the Red Crag Formation in southern East Anglia.

36. The Bedrock Aquifer Designation Map indicates the areas of Red Crag Formation to be a Principal Aquifer and the underlying London Clay to be Unproductive Strata.

37. Tuddenham St Martin Landfill is within a groundwater Outer Source Protection Zone (Zone 2). Groundwater Source Protection Zones have been defined by the Environment Agency, these zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. There are three main zones (inner, outer and total catchment) and a fourth zone of special interest. The Outer zone (Zone 2) is defined by a 400 day travel time from a point below the water table to the source of groundwater abstraction.

38. Depth to groundwater along the cable corridor route is to be confirmed by the Phase 2 Investigation post fieldwork monitoring, which has subsequently been completed in July 2016.

3.3 Tuddenham St Martin Previous Ground Investigation

39. A comprehensive site investigation of Tuddenham Landfill was commissioned by the Environment Agency (Eastern Area) in 1999. Extracts from the Interpretative Report prepared by ARCADIS Geraghty and Miller International Inc. (Report Number: 911230003, dated April 2000), have been provided to IEC for review by the Environment Agency The main points of relevance to this assessment, obtained from the ARCADIS report extracts received are summarised in paragraphs 43 to 62 below;

40. In addition to the report text and exploratory hole records, two figures compiled during interpretation of investigation results have been supplied, both identify exploratory hole locations. Figure 9 is entitled 'Depth of Waste' and Figure 10, 'Groundwater Contour Plan'. For ease of reference, these ARCADIS report extracts are presented as Appendix 5 of the Phase 1 Desk Study Report (Ref No IEC-EHWF-1A8L-01-Rev0;)

41. The 2000 investigation scope comprised:

a. Eight cable percussion borehole locations; drilling was continued until the top of the London Clay was reached, the holes were bored to a maximum depth of 18.18m. Standpipes were installed for landfill gas and groundwater monitoring.
b. Twenty trial pits to delineate the landfill boundaries, excavated to a maximum depth of 2.70m.
c. Material Sampling, insitu PID monitoring and Chemical Analysis.
d. In situ permeability testing of natural strata.

e. Post fieldwork standpipe monitoring.
f. Interpretative Report.

42. The report introduction includes a useful site history, with further detail of landfill operations. It is anecdotally noted locally, that the area was used for sand extraction down to, but not below, the water table prior to the 1940's. Infilling with demolition and construction waste started sometime after 1940, the landfill site was known as 'Weavers Tip' at the time. During the mid-1960's, fertiliser waste (floor 'sweepings' from local manufacturers) was apparently placed in the landfill. Anecdotal evidence in 2000, noted in the ARCADIS report, suggested it was placed at the base of the site, above the water table. In the early 1990's, illegal disposal of non-inert waste was deposited, that was known to include putrescible material. Photographs taken by the regulatory authorities at the time, suggested that hydrocarbon related liquids and chemicals may have been deposited, as well as bonded asbestos.

43. A summary of investigations prior to the 2000 report is included in the 2000 report introduction. In 1993, Suffolk County Council installed eight gas monitoring boreholes on the western site boundary, one of which was observed on the July 2015 site walkover. Methane was initially detected at 4%, which dropped to less than detection limit after 18 months. The Environment Agency also carried out hydrogeological modelling of the shallow aquifer using FLOWPATH prior to 2000 and determined a migration time of 5 to 10 years for leachate from the landfill reaching the springs. The spring discharge is believed to represent 20% of the groundwater flow in the aquifer directly beneath the landfill site.

44. The exploratory holes from the 2000 investigation in closest proximity to the cable route crossing are Trial Pits TP5, TP6, TP13 and TP15 and Borehole B1. The remaining seven boreholes were located where the greatest thickness of waste was encountered, to the south of the cable route corridor; the next closest borehole to the cable route, BH5, is positioned just over 50m to the south.

45. The waste delineation exercise carried out in 2000, as part of the ARCADIS investigation, indicates that the extent of waste terminates within the cable route corridor approximately 5m within the eastern site boundary and up to 30m within the western site boundary, i.e. only 75m of the 110m cable route within the landfill may encounter waste. Both BH1 and TP15 in the west did not encounter waste and TP5 proved the eastern lateral extent of waste by trenching.

46. Across the whole landfill area the maximum proved thickness of waste was 12.8m (BH4), but within the cable route corridor the waste present is probably thinner, the maximum thickness was not proved by boreholes, but TP6 and TP13 were terminated in waste at 2.00m depth. The depth of waste contours plotted on Figure 9 indicates that waste of less than 10m in thickness would present beneath the route corridor.

47. During the 2000 investigation it was observed that the majority of waste throughout the landfill consisted of builders rubble comprising bricks, concrete, stone paving slabs, wood, glass, metal nails and wires. There were also many plastic bags, plastic sheeting and tarpaulins. Other localised types of waste encountered included domestic waste food packaging, crushed oil cans and drums and bonded asbestos fragments at one location. The waste was found to be generally dry, but with occasional minor quantities of water perched on top of clayey layers within the fill.

48. A review of the exploratory hole records located within the cable route corridor, for the Phase 1 Desk Study (Ref No IEC-EHWF-1A8L-01-Rev0;),confirms that, where present, the fill materials predominantly comprised builders rubble. However, below 1.40m depth in TP13 only, organic clayey peat fill was encountered beneath the builders rubble which included bricks, plastic containers and wood planks, a strong organic odour was also noted. The base of the peaty fill was not proved; TP13 was terminated at 2.00m depth.

49. The only borehole within the cable corridor route (BH1) did not encounter any landfill, although the top 0.20m of topsoil included clinker and brick fragments. The sequence of natural strata proved comprised; generally orange brown medium grained sand with occasional flint gravel to 2.90m depth, pale yellow brown sand was present from 2.90m to 4.00m depth, underlain by orange brown sand and gravel with shell fragments to 8.50m depth. These natural granular materials were understood to be from the Red Crag Formation. London Clay, recovered as dark grey clay was encountered at 8.50m depth and BH1 was terminated in this stratum at 9.10mbgl. A water strike was recorded at 7.50m depth within the sand and gravel, no rise was noted. Post fieldwork groundwater monitoring of the standpipe in BH1 recorded a piezometric elevation of 25.225mAOD, with the ground level of BH1 at 30.178mAOD, this corresponds to a depth of 4.953mbgl, around 5.00m.

50. Post fieldwork monitoring of the standpipes in the remaining boreholes, where waste was encountered, indicated that over most of the landfill the water table lies above the base of the waste, generally by less than a metre, but by just over 2 metres in BH2. Figure 10, the Groundwater Contour Plan, shows a slight fall of piezometric elevation in a west-south-west direction across the site and towards the River Fynn, from around 25.2mAOD to 24.70mAOD. On comparison with existing ground levels, these monitored elevations correspond to water table depths of between 10.40mbgl and 14.80mbgl.

51. During insitu variable head permeability testing of the granular Red Crag Formation in the borehole standpipes, rapid recovery response of generally less than a minute was noted for both rising and falling head slug tests. From these results, a hydraulic conductivity in the order of 4.5m/day was calculated.

52. Samples of the Red Crag Formation underlying the waste materials were analysed for cation exchange capacity (CEC) and total organic carbon (TOC) with the objective of assessing potential for natural attenuation of any contaminants leaching from the waste. The test results indicated that both sorption and cation exchange in these granular strata would be unlikely to be significant mechanisms for any contaminant attenuation.

53. Laboratory testing of 26 environmental samples of waste was carried out for both total and leachable concentrations of a range of common contaminants. Elevated total concentrations in the waste mass included nickel, lead, zinc, cadmium and Semi-Volatile Organic Compounds (SVOCs) (principally Polyaromatic Hydrocarbons (PAHs). Only lead and sulphate were detected at significant concentrations in the waste leachate.

54. Leachates prepared from samples of natural granular strata (Red Crag Formation) immediately underlying the waste were also analysed in the laboratory. The results were compared with freshwater Environmental Quality Standards (EQS, 1999). Ammoniacal Nitrogen concentrations in the leachates exceeded the freshwater EQS of 0.015mg/l in 19 out of the 24 samples analysed. The highest concentration detected was 10.6mg/l and these tests indicated that Ammoniacal Nitrogen was the most significant constituent of the leachates.

55. Groundwater samples taken from within the Red Crag Formation were also analysed in the laboratory and elevated levels of Ammoniacal Nitrogen, sulphate, chloride, and certain Volatile Organic Compounds (VOCs) were determined. As with leachate from the Red Crag Formation, summarised in paragraph 57, Ammoniacal Nitrogen was also the most significant constituent of the groundwater, with concentrations ranging from 1.2mg/l to 230mg/l compared to the freshwater EQS of 0.015mg/l.

56. The 2000 investigation report notes that the landfill is not capped and rainfall will continue to infiltrate into the surface of the site, leading to continuing and long term contaminated leachate generation, likely to impact groundwater quality for many years.

57. Ground gas monitoring of the borehole standpipes recorded elevated concentrations of both carbon dioxide and methane and the report notes that the majority of wastes comprise only slowly degradable wastes that may continue to generate low volumes of landfill gas over many years.

58. The report observes in its conclusions, that capping the site to reduce leachate generation potential and reduce impacts on groundwater quality, would probably result in an increase in potential for gas migration (towards neighbouring residential properties) and gas control measures may then be required.

59. Whilst the 2000 investigation report prepared by ARCADIS is comprehensive and the principal findings are clear, it is noted that guidance for the investigation of potentially contaminated land has been significantly and severally updated in the last 15 years prior to preparation of the EA ONE Phase 1 Desk Study Report in 2015.

3.4 Tuddenham St Martin Landfill History

60. Available records indicate that sand pit excavation did not take place until after 1928, but the pit was operational by 1945 in the northern half of the landfill site, beneath much of the 110m long cable route corridor, with the excavated area extending to approximately 150m by 100m in total. By 1958, sand pit excavation within the landfill area had extended southwards; in 1969 operations at the site had expanded, including both sand abstraction in the south and landfilling in the northern half, with the refuse boundaries indicating approximately 50% of the cable route corridor to be underlain by waste. The southern half of the

later landfill area was still annotated as a sand pit, with a track dividing the refuse and sandpit activities. In 1984, the tracks within the landfill were as indicated on the 1969 map edition, but the landfill area was labelled as 'pit disused'. By 1994, the large scale mapping edition gave no indication of previous excavation, or filling activity within the landfill site. The entrance to the landfill remained at the same location, but with an additional entrance formed in the southern corner. The track layout within the area also changed; tracks no longer traversed the site but were indicated to run adjacent and parallel to the sites' western and southern boundaries. During the July 2015 walkover visit, not all tracks on the 1994 map edition were obvious, but otherwise the site shows no evidence of change since 1994.

61. The solid geology immediately underlying the landfill is indicated on geological maps, published by the British Geological Survey (BGS) to have been the Chillesford Church Sand Member, with the whole width of this deposit being formerly worked at this location.

62. The Envirocheck Report had four recorded entries related to this landfill, which is also shown on the accompanying Site Sensitivity Maps included in the Phase 1 Desk Study appendices (Ref No IEC-EHWF-1A8L-01-Rev0;). The area is recorded as landfill by the BGS, but with no further detail other than area extent. The Environment Agency has record of two licenses being issued for this registered landfill, the first to licence holder, The Brow Group, in 1978 (licence ref: 907/01/16/08), which was superceeded in 1989 by a new licence (ref: 907/01/16/18), for which the licence holder was Gilltex Estates. Both licenses authorised waste which was non notifiable construction/demolition material and prohibited putrescible waste. After 1989, dry waste was also stipulated. The fourth recorded entry in the Envirocheck Report is for historic landfill sites; this records the waste input date range to have commenced in December 1948 and ceased in December 1991.

3.5 Culpho Hall Published Geology

63. The area of Culpho Hall Landfill is indicated to be underlain by drift deposits of the Kesgrave Catchment Subgroup predominantly comprising pre Glacial fluvial gravels.

64. The solid geology is indicated on BGS published geological maps to be deposits from the Red Crag Formation.

65. The Bedrock Aquifer Designation Map supplied in 2015, indicates the areas of Red Crag Formation to be a Principal Aquifer and the underlying London Clay to be Unproductive Strata.

66. The Superficial Aquifer Designation Map indicates the Kesgrave Catchment Subgroup to be a Secondary A Aquifer.

67. The Culpho Hall Landfill is within the influence of a groundwater Source Protection Borehole located in Playford, approximately 250m to the south of Culpho Corner and this area is therefore within Zone 1 (Inner Protection Zone).

Depth to groundwater beneath the Culpho Hall Landfill area is not known and therefore the potential for the proposed cable route to impact on the groundwater quality beneath the site cannot be assessed at Desk Study stage, but will be considered further during Phase 2 investigation.

68. Culpho Hall Landfill Identification

69. The Envirocheck Report has identified the presence of Culpho Hall Landfill, a Suffolk Coastal District Council registered Landfill immediately to the southeast of Culpho End. The actual position of this landfill is not clear with different sources reviewed for the Phase 1 Desk Study (Ref No IEC-EHWF-1A8L-01-Rev0;) providing two different, but overlapping locations.

70. The Envirocheck Report had one recorded entry for a historic landfill related to this area, which is also shown on the accompanying Site Sensitivity Maps, appended within the Phase 1 Desk Study (Ref No IEC-EHWF-1A8L-01-Rev0;). The two references associated with the single entry for this site are EAHLD03310 and OFSSC17. No details of type of waste deposited or waste date input range are available.

71. The available historic mapping detailed in the Phase 1 Desk Study (Ref No IEC-EHWF-1A8L-01-Rev0;), does not give any indication of either previous excavation, or infilling in this area.

72. The Contaminated Land Officer for Suffolk Coastal District Council (SCDC) (Mr George Onuaha) confirmed that SCDC do not hold any details of the landfill in terms of operational dates, type of waste(s) deposited etc. The site had been included in

their Part 2A walkover, but was considered to be of low priority, particularly as no development was planned in the vicinity at the time.

73. The East Anglia One Environmental Statement in 2012, identified this historic landfill as a former sand pit from historic maps, but this was not confirmed by the more targeted Desk Study in 2015, when no evidence of a sand pit could be identified on the historic mapping. The closest historic sand pit identified was situated to the north of Grundisburgh Road, to the west of Culpho Hall.

74. During the site walkover in July 2015, the fields of interest were in crop and very gently sloped to the south, there was no surface evidence that this area of ground had previously been disturbed.

75. As so little information was available for Culpho Hall Landfill, intrusive site investigation was recommended by the 2015 Phase 1 Desk Study(Ref No IEC-EHWF-1A8L-01-Rev0;) , to determine the actual landfill location and assess the risk of potentially contaminated land being present.

4 Phase 2 Investigation Fieldwork

4.1 Introduction

76. Resource and Environmental Consultants (REC) Ltd were commissioned in April 2016 by IEC to undertake the Phase 2 investigation at Tuddenham St Martin Landfill and the area identified as possible landfill at Culpho Hall.

77. REC have prepared a Factual Report for each of the two sites, which are included as Appendix 3. The Exploratory Hole Location Plans for both sites, frequently referred to, have additionally been abstracted and included as Appendix 2 of this report, for ease of reference.

78. The following documents were issued to REC prior to commencement of works:

- East Anglia ONE Offshore Windfarm – Selected Geo-environmental Ground Investigation of Onshore Cable Route. Technical Specification (Ref: EA1-CON-I-IBR-001436 Rev0), dated November 2015;
- East Anglia ONE Offshore Windfarm – Phase 1 Desk Study Report by IEC (Ref No IEC-EHWF-1A8L-01-Rev0), dated August 2015;
- Indicative exploratory hole locations:
  i. EA1-GRD-DG-IEC-007731_Proposed Exploratory Hole Location Plan Culpho Hall Landfill Rev 0B.pdf
  ii. EA1-GRD-DG-IEC-007732_Proposed Exploratory Hole Location Plan Tuddenham St Martin Landfill Rev 0A.pdf
  iii. EA1-GRD-DG-IEC-007733_Spring_Sampling_Tuddenham_Landfill Rev 0B.pdf (IEC)

79. The principal objective of the investigation was to determine the extent, depth and composition of any landfill (i.e. potentially contaminated land and groundwater), in order to refine the ground model and update the Phase 1 geoenvironmental assessment of each site, within the Phase 1 Desk Study (Ref No IEC-EHWF-1A8L-01-Rev0;)

4.2 Tuddenham St Martin - Fieldwork

80. The agreed scope of work comprised surface water quality monitoring, three cable percussion boreholes and six trial pits with associated sampling and in situ testing.

81. Fieldwork was undertaken from 1st to 7th June 2016.

82. The locations of the exploratory holes were agreed by IEC and set out by REC Limited using the coordinates provided. Following completion, the positions were surveyed relative to Ordnance Datum and coordinated to the National Grid.

83. The distribution of the exploratory holes within the cable route corridor was constrained by site topography, access for plant was not safely available on the steep slope between upper and lower site levels. Six of the nine exploratory hole locations were positioned on the upper site level, where a greater thickness of landfill was anticipated. The three boreholes were positioned along the centre line of the route corridor; BH03-TM at the upper site level close to the eastern site boundary; BH02-TM close to the crest of the slope on the upper site level and BH01-TM beyond the toe of the slope at the lower site level, close to the western site boundary formed by Clopton Road. Each borehole was extended below the landfill and through the Red Crag Aquifer to prove the underlying low permeability London Clay (Thames Group). The six trial pits were located in two rows of three, to the north and south of the boreholes, within the cable corridor route; the trial pits investigated the shallow ground conditions likely to be encountered during construction of the cable route.

84. During investigation, representative environmental samples were obtained for laboratory testing.

85. A summary of the exploratory holes completed and in situ testing performed has been tabulated below:

Table 4.1 Fieldwork Summary Table - Tuddenham

Exploratory Hole Type	Exploratory Hole Reference	Depth (mbgl)	Further Detail
Machine Excavated Trial Pit	TP01-TM	2.5	Lower site level (west) In situ PID monitoring
	TP02-TM	2.5	Lower site level (west) In situ PID monitoring
	TP03-TM	2.4	Upper site level (slope crest) In situ PID monitoring
	TP04-TM	2.3	Upper site level (east) In situ PID monitoring
	TP05-TM	2.2	Upper site level (slope crest) In situ PID monitoring
	TP06-TM	2.0	Upper site level (east) In situ PID monitoring
Cable Percussion Boreholes	BH01-TM	12.0	Lower site level (west) Standard Penetration Testing Gas and groundwater monitoring standpipe installed
	BH02-TM	18.5	Upper site level (slope crest) Standard Penetration Testing Gas and groundwater monitoring standpipe installed
	BH03-TM	19.5	Upper site level (east) Standard Penetration Testing Gas and groundwater monitoring standpipe installed

4.3 Tuddenham St Martin - Post Fieldwork Monitoring

86. Post fieldwork monitoring of the gas and groundwater levels in the boreholes was scheduled following installation of slotted 50mm diameter standpipes as detailed in the table below:

Table 4.2 Standpipe Response Zones - Tuddenham

Exploratory Hole Reference	Standpipe Response Zone (mbgl)
BH01-TM	10.00 - 1.00
BH02-TM	16.00 - 1.00
BH03-TM	16.50 – 1.00

87. Four post fieldwork gas and groundwater monitoring visits were undertaken, at approximately fortnightly intervals, between 14th June and 26th July 2016. The standpipes were developed during the first post fieldwork monitoring visit and on the second visit groundwater samples were obtained for environmental laboratory testing.

4.4 Tuddenham St Martin – Spring and Surface Water Monitoring

88. Prior to commencement of the investigation, surface water quality sampling and laboratory analysis for six existing Environment Agency monitoring points, between the landfill and the River Fynn, was undertaken to obtain pre-construction

baseline water quality data. To ensure the correct locations were monitored , REC were accompanied by a representative from the Environment Agency on 12.05.16, who was familiar with the spring monitoring points.

Table 4.3 Spring and Surface Water Sampling Points - Tuddenham

Monitoring Point Reference	Date Sampled	Further Detail
FYN011	12.05.16	River sample
FYN013	12.05.16	Piped Spring
FYN014	12.05.16	Spring
FYN016	12.05.16	Spring, former cress bed
FYN018	12.05.16	River sample
FYN020	06.06.16	River sample at Tuddenham Bridge

4.5 Culpho Hall –Fieldwork

89. The specified scope of work comprised ten trial pits with associated sampling and in situ testing, the trial pits were located on a non-targeted grid across the potential landfill area traversed by the cable construction route. Dependent upon Made Ground and evidence of a former landfill being encountered during trial pitting, three cable percussive boreholes with monitoring installations were also specified.

90. Fieldwork was undertaken from 2nd to 6th June 2016.

91. The locations of the exploratory holes were agreed by IEC and set out by REC Limited using the coordinates provided. Following completion, the positions were surveyed relative to Ordnance Datum and coordinated to the National Grid. The positions are shown on the Exploratory Hole Location Plan, abstracted from Appendix 3 and presented in Appendix 2. All factual data is presented in the REC report, included in Appendix 3 for reference.

92. A summary of the exploratory holes completed has been tabulated below:

Table 4.4 Fieldwork Summary Table - Culpho

Exploratory Hole Type	Reference	Depth (mbgl)	Further Detail
Machine Excavated Trial Pit	TP01-CH	2.5	In situ PID monitoring
	TP02-CH	n/a	Not excavated due to close proximity of badger sett
	TP03-CH	2.5	In situ PID monitoring
	TP04-CH	2.5	In situ PID monitoring
	TP05-CH	2.5	In situ PID monitoring

	TP06-CH	2.5	In situ PID monitoring
	TP07-CH	2.5	In situ PID monitoring
	TP08-CH	2.8	In situ PID monitoring
	TP09-CH	2.5	In situ PID monitoring
	TP10-CH	2.5	In situ PID monitoring
Cable Percussion Boreholes	n/a	n/a	Boreholes not required as Made Ground not encountered in Trial Pits

5 Phase 2 Investigation Laboratory Testing

5.1 Introduction

93. Geoenvironmental laboratory testing schedules were prepared by IEC. The testing was carried out by REC at the UKAS accredited laboratories of Scientific Analysis Laboratories (SAL) in Essex (UKAS Testing No.1549). The laboratory tests scheduled are summarised below and the results received presented in the REC Factual Reports in Appendix 3.

94. All testing was completed without any laboratory non-compliances.

5.2 Tuddenham St Martin - Laboratory Testing

5.2.1 Soils

95. The following range of environmental analysis was scheduled on selected soil samples obtained:

Table 5.1 Laboratory Testing Summary – Soil – Tuddenham

Test Type and Determinants	Limit of Detection	No. Scheduled
Arsenic	2 mg/kg	34
Boron	1 mg/kg	34
Cadmium	0.1 mg/kg	34
Chromium (total)	0.5 mg/kg	34
Lead	2 mg/kg	34
Mercury	1 mg/kg	34
Nickel	0.5 mg/kg	34
Zinc	2 mg/kg	34
pH	-	34
Water soluble sulphate (as SO4)	0.01 g/l	34
Organic matter	0.1 %	34
Total petroleum hydrocarbons	10 mg/kg	34
Speciated polyaromatic hydrocarbons (USEPA 16)	0.1 mg/kg	34
Phenol	1 mg/kg	34
Cyanide (total)	1 mg/kg	34
Asbestos Bulk ID	Presence of fibres	34
TPH CWG with BTEX (C6 to C35)	0.1-2mg/kg	34
Cyanide (free)	1 mg/kg	34

Test Type and Determinants	Limit of Detection	No. Scheduled
Selenium	3 mg/kg	34
Vanadium	0.1 mg/kg	34
Chloride	2 mg/kg	34
Ammonia	0.5 mg/kg	34
VOCs	5-50 µg/kg	19
Supplementary Quantitative Asbestos Analysis	0.001%	4
Leachate Preparation	n/a	18

96. Within the Tuddenham St Martin landfill, the soil samples selected were taken from across the site area, both upper and lower level. The majority of samples analysed were of Made Ground in the top 2 to 3 metres, but samples from the underlying Red Crag Formation sand, which may be contaminated from the landfill above, were also analysed from the boreholes, to obtain a profile of contamination with depth.

97. The testing suite included a range of commonly occurring contaminants which could be compared to guideline values available for the receptor of long term human health.

98. One testing strategy objective was to identify the presence of any asbestos containing materials present. The initial asbestos identification by polarised light microscopy identified the presence of asbestos fibres in four of the thirty four samples analysed. Supplementary quantitative asbestos analysis was subsequently scheduled on the four samples containing asbestos fibres, to determine the percentage of fibres present within the soil mass.

99. Based on Phase 1 Desk Study research, contaminants of specific concern to the Environment Agency were identified, in particular Ammonia and VOCs. These determinants were therefore added to the analysis suite.

100. Approximately half of the soil samples analysed were also scheduled for leachate preparation, as groundwater quality is of particular relevance to assessment of this site.

5.2.2 Water Quality

101. The following suite of water quality analysis was scheduled for eighteen soil leachates and three groundwater samples, which were obtained during post fieldwork monitoring from the standpipes in BH1, BH2 and BH3.

Table 5.2 Laboratory Testing Summary – Groundwater Quality – Tuddenham

Test Type and Determinants	Limit of Detection	No. Scheduled
Arsenic	0.2 µg/l	21
Boron	0.05 mg/l	21
Cadmium	0.02 µg/l	21
Chromium (total)	1 µg/l	21
Lead	0.3 µg/l	21
Mercury	0.05 µg/l	21
Nickel	1 µg/l	21
Zinc	2 µg/l	21
pH	-	21
Water soluble sulphate (as SO4)	0.5 mg/l	21
Total petroleum hydrocarbons	20 µg/l	21
Speciated polyaromatic hydrocarbons (USEPA 16)	0.01 µg/l	21
Phenol	0.02 mg/l	21
Cyanide (total)	0.01 mg/l	21
Ammoniacal nitrogen	0.05 mg/l	21
Total Hardness expressed as CaCO3	10 mg/l	21
Nitrate	0.5 mg/l	21
Nitrite	0.1 mg/l	21
Chloride	1 mg/l	21
BOD	1 mg/l	21
COD	20 mg/l	21

102. Ammoniacal Nitrogen, the contaminant of particular concern to the Environment Agency for this site. is already included within this standard groundwater quality suite.

5.2.3 Surface Water Quality

103. The following suite of surface water quality analysis, which includes parameters of particular relevance to the Environment Agency remediation monitoring action, was scheduled for the six surface water samples obtained from the springs and River Fynn prior to commencement of the investigation, to provide a pre-construction baseline benchmark.

Table 5.3 Laboratory Testing Summary – Surface Water Quality – Tuddenham

Determinand	Number of Sampling Points	LOD (Limit of Detection)	Units
Ammonia as NH3	6	0.05	mg/l
Biochemical Oxygen Demand (Allyl Thiourea) (BOD)	6	1	mg/l
pH	6		
Chemical Oxygen Demand (COD)	6	20	mg/l
Sulphate	6	0.5	mg/l
Total Hardness expressed as CaCO3	6	10	mg/l
Volatile Organic Compounds (VOCs)	6	1	ug/l

5.2.4 Waste Classification

104. Shallow environmental samples at depths of between 0.50m and 1.0m were obtained and scheduled for a full Waste Acceptance Criteria (WAC) suite of analysis , in order to characterise material to be excavated for off-site disposal if required.

Table 5.4 Laboratory Testing Summary – Waste Classification – Tuddenham

Test Type and Determinants	Limit of Detection	No. Scheduled
Soil analysis		5
Total organic carbon	0.1 %	5
BTEX	10 µg/l	5
PCBs (7 congeners)	20 µg/l	5
Mineral oil (C 10 -C 40)	10 mg/kg	5
PAHs	0.1 mg/kg	5
Loss on ignition	0.1 %	5
pH	-	5
Leachate analyses		5
Arsenic	0.2 µg/l	5
Barium	1 µg/l	5

Cadmium	0.02 µg/l	5
Chromium (total)	1 µg/l	5
Copper	0.5 µg/l	5
Mercury	0.05 µg/l	5
Molybdenum	1 µg/l	5
Nickel	1 µg/l	5
Lead	0.3 µg/l	5
Antimony	1 µg/l	5
Selenium	0.5 µg/l	5
Zinc	2 µg/l	5
Chloride	1 mg/kg	5
Fluoride	0.05 mg/l	5
Sulphate (as SO4)	0.5 mg/l	5
Total dissolved solids	1 mg/l	5
Phenol index	0.02 mg/l	5
Dissolved organic carbon at own pH or pH 7.5-8.0	1 mg/l	5

5.3 Culpho Hall – Laboratory Testing

5.3.1 Soils

105. The following range of environmental analysis was scheduled for nine soil samples obtained.

Table 5.5 Laboratory Testing Summary – Soil - Culpho Hall

Test Type and Determinants	Limit of Detection	No. Scheduled
Arsenic	2 mg/kg	9
Boron	1 mg/kg	9
Cadmium	0.1 mg/kg	9
Chromium (total)	0.5 mg/kg	9
Lead	2 mg/kg	9
Mercury	1 mg/kg	9
Nickel	0.5 mg/kg	9
Zinc	2 mg/kg	9
pH	-	9

Test Type and Determinants	Limit of Detection	No. Scheduled
Water soluble sulphate (as SO4)	0.01 g/l	9
Organic matter	0.1 %	9
Total petroleum hydrocarbons	10 mg/kg	9
Speciated polyaromatic hydrocarbons (USEPA 16)	0.1 mg/kg	9
Phenol	1 mg/kg	9
Cyanide (total)	1 mg/kg	9
Asbestos Bulk ID	-	9
TPH CWG with BTEX (C6 to C35)	0.1-2mg/kg	9
Cyanide (free)	1 mg/kg	9
Selenium	3 mg/kg	9
Vanadium	0.1 mg/kg	9
Chloride	2 mg/kg	9
Leachate Preparation	n/a	3

106. Whilst no Made Ground deposits, i.e. potentially contaminated soils, were encountered during the Culpho Hall Phase 2 investigation, a limited number of shallow soil samples across the site were scheduled for the same suite of analysis as the Tuddenham St Martin soils, to confirm that the site is uncontaminated.

5.3.2 Leachates

107. The following suite of water quality analysis was scheduled for three soil leachates.

Table 5.6 Laboratory Testing Summary –Leachate- Culpho Hall

Test Type and Determinants	Limit of Detection	No. Scheduled
Arsenic	0.2 µg/l	3
Boron	0.05 mg/l	3
Cadmium	0.02 µg/l	3
Chromium (total)	1 µg/l	3
Lead	0.3 µg/l	3
Mercury	0.05 µg/l	3
Nickel	1 µg/l	3
Zinc	2 µg/l	3
pH	-	3

Test Type and Determinants	Limit of Detection	No. Scheduled
Water soluble sulphate (as SO4)	0.5 mg/l	3
Total petroleum hydrocarbons	20 µg/l	3
Speciated polyaromatic hydrocarbons (USEPA 16)	0.01 µg/l	3
Phenol	0.02 mg/l	3
Cyanide (total)	0.01 mg/l	3
Ammoniacal nitrogen	0.05 mg/l	3
Total Hardness expressed as CaCO3	10 mg/l	3
Nitrate	0.5 mg/l	3
Nitrite	0.1 mg/l	3
Chloride	1 mg/l	3
BOD	1 mg/l	3
COD	20 mg/l	3

108. Three soil samples were scheduled for the same suite of water quality analysis as the Tuddenham St Martin site, to confirm the potential for leaching of contamination into the underlying groundwater is negligible.

6 Ground Model

6.1 Tuddenham St Martin Strata Encountered

109. The ground conditions encountered during this investigation, the fieldwork scope of which is detailed in Section 4, generally confirmed the Phase 1 Desk Study findings, including published geology and the previous investigations of the site reviewed during Desk Study preparation.

110. The following strata have been identified:

- Made Ground (Landfill) – All locations
- Lowestoft Formation (chalky till) – TP05-TM and TP06-TM only
- Red Crag Formation (sand) – All three boreholes, TP02-TM and TP01-TM
- Thames Group (London Clay) – All three boreholes only

6.1.1 Made Ground (Landfill) – All locations

111. Made Ground (Landfill) deposits were encountered at each of the nine exploratory hole locations and proved to extend to depths of between 0.50m (BH01-TM) and 10.00m (BH02-TM). Two exploratory holes were terminated within the Made Ground; TP03-TM at 2.40m depth and TP04-TM at 2.30m depth.

112. As noted in the Phase 1 Desk Study walkover of the site; the ground surface was generally overgrown, with detritus such as concrete and wire frequently visible.

113. The Made Ground deposits encountered were inherently variable in composition. Detritus fragments generally included; brick, wire, concrete, wood, plastic, metal and glass, with lesser proportions of asphalt, clinker and pottery. The detritus fragments were predominantly within a brown sand matrix, particularly at depths shallower than 3.5m, although some localised variations of silt, gravel, or clay matrices were also noted.

114. The only two exploratory holes which proved Made Ground to more than 2.40m depth were BH02-TM and BH03-TM, where Made Ground was encountered to 10.00m and 9.50m respectively. At these two locations, some variations in Made Ground strata with depth were noted below 3.50m. At the location of BH02-TM, the Made Ground deposits between 3.50m and 7.70m were recorded to comprise the full range of detritus, in addition to frequent tarpaulin sheets, within a matrix of dark blue grey slightly clayey, gravelly sand; below 7.70m, the Made Ground matrix was described as grey brown sand, with frequent detritus of plastic fragments only. At the location of BH03-TM, soft black ashy gravelly clay with fragments of brick, concrete, occasional metal and wood was noted from 3.50m to 6.50m depth, below which red brown clay with gravel of brick, concrete and occasional glass was encountered to 9.50m depth.

115. No odours were noted to be emanating from the Made Ground deposits and none of the insitu PID tests carried out at metre intervals within the trial pits recorded any VOC gases to be present.

116. The Made Ground detritus fragments were generally described as gravel or cobble sized, with occasional boulders. No large buried obstructions were noted during trial pit excavation, or boring.

117. To provide an indication of the presence of any voids, loose or soft spots within the Made Ground, standard penetration tests were performed in all three boreholes, at metre intervals to 5.0m depth and at 1.5m intervals below. At 1.2m and 2.0m in BH02-TM, two exceptionally low Standard Penetration Test (SPT) N values of 1 and 3 respectively were recorded, indicating the Made Ground to be very loose. The remaining 13 tests in Made Ground recorded SPT N values in the range of 7 to 20, corresponding to an insitu relative density for sand of loose to medium dense.

118. As anticipated, the Made Ground deposits encountered at the lower site level (BH1, TP1 and TP2 refer), were generally thinner than the upper site level, ranging from 0.50m in BH01 and TP2, to a maximum thickness of 1.60m of Made Ground

being proved in TP1. The reduced level for the base of Made Ground deposits in the lower site level varied by less than 1m, being between around 30.70mAOD and 31.70mAOD.

119. Within the upper site level, the maximum thickness of Made Ground deposits proved by BH02-TM and BH03-TM, indicated the base of the landfill to be at a reduced level of 29.70mAOD and 28.70mAOD respectively. However, at this upper level, the ground conditions encountered in TP05 and TP06 towards the southern and eastern extent of the route corridor within the landfill site, indicate that the thickness of Made Ground may thin towards the eastern site boundary, proved to 1.90m depth in TP05 and 0.80m depth in TP06, which for TP6 corresponds to a reduced level for landfill base of just above 39mAOD.

120. The exact lateral extent of the landfill has not been confirmed by the investigation. It would be prudent to plan construction works anticipating the landfill to extend for the whole 110m length of the route corridor within the site, but thinning to less than 1m thick within 10m of both eastern and western site boundaries.

6.1.2 Lowestoft Formation (chalky till) – TP05-TM and TP06-TM only

121. Brown and grey white, friable clay with gravel of chalk and flint, assumed to be a natural drift deposit, was encountered underlying Made Ground deposits at the location of TP05-TM, from 1.90 to 2.20m depth and in TP06-TM, from 0.80m to 2.00m depth. Both trial pits were terminated in this deposit.

6.1.3 Red Crag Formation (sand) – All three boreholes, TP02-TM and TP01-TM

122. Underlying Made Ground, natural sand deposits from the Red Crag Formation were encountered in TP02-TM, TP01-TM and all three boreholes. The material was generally described as brown slightly gravelly silty sand, with the gravel comprising flint fragments.

123. Sixteen SPT tests in total were performed in this stratum, the majority of which indicated the sand to be medium dense. However, the four shallowest results at the location of BH01-TM in the lower site level recorded values of between 4 and 6, indicating the sand to be loose shallower than 4.5m depth.

124. TP02-TM and TP01-TM were terminated in this deposit at 2.50m depth. The Red Crag Formation was proved for a maximum thickness of 9.25m in BH01-TM, the reduced level of the base of this stratum in all three boreholes was within a metre, between approximately 21.50m and 22.50mAOD.

6.1.4 Thames Group (London Clay) – All three boreholes only

125. Underlying the Red Crag Formation, stiff to very stiff dark blue grey clay was encountered in each of the three borehole locations and proved for a minimum of 2.00m depth.

126. All three boreholes were terminated within the Thames Group (London Clay).

6.2 Tuddenham St Martin Groundwater Encountered

6.2.1 Groundwater Encountered During Fieldwork

127. All six trial pits remained dry during fieldwork.

128. Groundwater was encountered during boring of all three boreholes within the Red Crag Formation at a reduced level of between 23.5m and 25mAOD, corresponding to depths of 7m, 14.5m and 15.5mbgl in Bh01-TM, BH02-TM and BH03-TM respectively.

129. The comments on groundwater conditions are based on the observations made at the time of the investigation. It should be noted that groundwater levels vary owing to seasonal and other effects.

6.2.2 Post Fieldwork Monitoring

130. Four post fieldwork monitoring visits of the borehole standpipes installed were carried out within two months of fieldwork completion, as detailed in Section 4.3. The fluctuation of groundwater level in each borehole between all visits was less than 50mm, the highest water level depths recorded ranged from 6.12m (BH01-TM) to13.15m (BH03-TM). The monitored water table was at approximately 26mAOD, i.e. within the Red Crag Formation at each borehole location and at least 2.5m below the base of the Made Ground deposits.

131. On the basis of the groundwater monitoring completed, the groundwater table is in excess of 4 metres below the proposed maximum depth of excavation required for construction works.

6.3 Culpho Hall Strata Encountered

132. The ground conditions encountered during this investigation generally confirmed the published geology. The Phase 1 Desk Study had not been able to confirm the presence of a former landfill at this location and uncertainty remained. This Phase 2 investigation did not find any evidence of the area being used as landfill, no Made Ground deposits were encountered.

133. The following strata have been identified:

- Topsoil – All locations
- Kesgrave Catchment Subgroup (sand) – All locations

6.3.1 Topsoil – All locations

134. Between 0.30m and 0.50m of Topsoil was encountered from ground surface in all ten trial pit locations. Typically, the Topsoil comprised dark brown slightly gravelly silty sand with frequent rootlets; no visual or olfactory evidence of contamination was encountered within this stratum.

6.3.2 Kesgrave Catchment Subgroup (sand) – All locations

135. Underlying Topsoil, natural drift deposits, generally comprising light brown slightly silty slightly gravelly sand were encountered. This sand stratum with flint gravel is typical of the Kesgrave Catchment Subgroup of pre Glacial fluvial drift deposits. Although fairly consistent across the investigated area, some localised variations within this stratum were noted, including variations in colour to pale yellow, variable quantities of gravel within the sand, clay laminations towards the base of TP05-CH and TP06-CH and rare orange veining below 2.00m depth in TP09-CH.

136. No visual or olfactory evidence of contamination was encountered within this stratum.

137. All ten trial pits were terminated within this stratum at depths of between 2.50m and 2.80mbgl.

6.4 Culpho Hall Groundwater Encountered

138. Nine of the ten trial pits remained dry during fieldwork. A seepage of groundwater was noted in TP10-CH at 1.30m depth, equivalent to a reduced elevation of 24.2mAOD.

139. As TP10-CH was situated at the lowest site level investigated, the remaining trial pits did not extend to the elevation where groundwater was encountered; it is therefore not possible to determine if this groundwater seepage represents the groundwater table across the site.

140. As no landfill was encountered at Culpho Hall, boreholes and post fieldwork monitoring in borehole standpipes were not required.

141. The comments on groundwater conditions are based on the observations made at the time of the investigation.

7 Tuddenham St Martin Geoenvironmental Assessment

7.1 Context

142. During preparation of the Phase 1 Desk Study Report for this site, an Initial Conceptual Model was developed and preliminary risk assessment applied. Following the Phase 1 Desk Study stage of investigation, the potential environmental risks associated with the proposed redevelopment of the site were considered to range from low, to medium to high. A copy of the Initial Conceptual Model is reproduced from the Phase 1 Desk Study below as Table 7.1.

Table 7.1 Initial Conceptual Model –Tuddenham St Martins

Contamination Linkage Elements			Qualitative Risk Assessment			Managing Risk
Sources	**Pathways**	**Receptors**	**Complete Linkage**	**Severity**	**Risk Rating**	**Action required**
Potentially contaminated soils	Inhalation/ Ingestion/ Dermal Contact	Human Receptors - site users following construction	Possible	Moderate	Low to Medium	Made Ground deposits potentially containing isolated hotspots of bonded asbestos anticipated. Sample and analyse soils on a non-targeted grid across the cable route to obtain baseline data during Phase 2 investigation. Confirmation Made Ground extents also to be targeted.
	Inhalation/ Ingestion/ Dermal Contact	Human Receptors- construction workers	Likely	Moderate	Medium to High	Appropriate PPE to be worn when working with Made Ground materials. Good standard of site hygiene to be maintained.
	Direct contact/ Root uptake	Flora and Fauna	Likely	Low	Low	
Potentially contaminated ground water	Flow off site	Surface Waters	Likely	Moderate to High	Medium to High	Known Ammonia contamination. Sample and analyse groundwater and surface water to obtain baseline data during Phase 2 investigation.
	Net deterioration of Groundwater	Groundwater in larger area	Likely	Moderate to High	Medium to High	
Hazardous ground gas (methane and carbon dioxide)	Inhalation, migration and accumulation in confined areas	Human Receptors – construction workers and site end users	Possible	Low	Low	Gas monitoring programme to confirm low risk recommended during Phase 2 investigation.

143. The geoenvironmental focus of this investigation stage 2 phase was to obtain data relevant to the initial contamination hypotheses. The data has been used to assess the validity of the initial assessment, prepare a Revised Conceptual Model and advise the proposal of appropriate mitigation measures during construction where required.

7.2 Human Health Risk Assessment

144. The soil samples were scheduled to be analysed in the laboratory as detailed in Section 5.2.1. The testing suite included a range of commonly occurring contaminants which could be compared to current published soil Land Quality Management/ Chartered Instiyute of Environmental Health (LQM/CIEH) S4ULs (suitable for use levels). The S4ULs have been derived in accordance with UK legislation and are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently-derived and cautious 'trigger values', above which further assessment of the risks, or remedial action may be needed.

145. The proposed cable route construction has been assessed using the commercial generic land use scenario. This is the most sensitive Contaminated Land Exposure Assessment CLEA model categorisation applicable to the proposed development relating to the receptor of long term human health (Environment Agency Science Report SC050021/SR3 – 2009)

146. A comparison of baseline data obtained from laboratory testing with available assessment criteria is tabulated below. For hydrocarbons, where the percentage of Soil Organic Matter affects the S4ULs, a conservative value of 1% has been used.

Table 7.2 Human Health Review of Analysis –Tuddenham St Martin

Test Description	Number of Tests	Assessment Criteria	Maximum Result (mg/kg, unless otherwise stated)	Number of Samples Exceeding Assessment Criteria	Comment
Arsenic	34	640	160	0	
Boron	34	240000	2	0	
Cadmium	34	190	26	0	
Chromium (total)	34	8600	140	0	
Copper	34	68000	1000	0	
Lead	34	630	980	2	
Mercury	34	25.8	2.1	0	
Nickel	34	980	120	0	
Zinc	34	730000	1400	0	
pH (range)	34		Range: 6.9 – 10.6		
Water soluble sulphate (as SO_4) (g/l)	34		4.4		
Organic matter (%)	34		7.8		
Total PAH	34		18		
Acenaphthene	34	84000	<0.01	0	
Fluorene	34	63000	0.03	0	
Phenanthrene	34	22000	1.2	0	
Anthracene	34	520000	0.3	0	
Fluoranthene	34	23000	2.9	0	
Pyrene	34	54000	2.5	0	
Benzo(a)Anthracene	34	170	1.5	0	
Chrysene	34	350	1.8	0	
Benzo(b)fluoranthene	34	44	1.6	0	
Benzo(k)fluoranthene	34	1200	1.6	0	

Test Description	Number of Tests	Assessment Criteria	Maximum Result (mg/kg, unless otherwise stated)	Number of Samples Exceeding Assessment Criteria	Comment
Benzo(a)Pyrene	34	35	1.8	0	
Indeno(123-cd)Pyrene	34	500	1.0	0	
Dibenzo(ah)Anthracene	34	3.5	0.4	0	
Benzo(ghi)Perylene	34	3900	1.1	0	
Acenaphthylene	34	83000	<0.01	0	
Napthalene	34	190	<0.01	0	
Phenol	34	760	<1	0	
Cyanide (total)	34		7		
Asbestos Bulk Identification	17	Presence of Fibres	Presence of Fibres	4	Asbestos Quantitative Analysis scheduled on samples with fibres detected
Asbestos Quantitative Analysis	4				Secondary Testing; results discussed in paragraph below.
Total Petroleum Hydrocarbons	34		2500		
TPH CWG with BTEX (C6 to C35):	34				All BTEX and lighter than C10 - Below Limit of Detection (LOD)
TPH (C10-C12 aliphatic)	34	9700	110	0	
TPH (C10-C12 aromatic)	34	16000	63	0	
TPH (C12-C16 aliphatic)	34	59000	71	0	
TPH (C12-C16 aromatic)	34	36000	120	0	
TPH (C16-C21 aliphatic)	34	1600000	410	0	
TPH (C16-C21 aromatic)	34	28000	150	0	
TPH (C21-C35 aliphatic)	34	1600000	1200	0	
TPH (C21-C35 aromatic)	34	28000	600	0	
Cyanide (free)	34		<1		
Selenium	34	1200	<3	0	
Vanadium	34	9000	140	0	
Chloride	34		560		
VOCs	19		Various		Thirteen samples below LOD, results discussed in paragraph below.
Ammonia	34		580		
Leachate Preparation	18		N/A		See Table 7.4 for results

147. In terms of long-term human health, the majority of determinants were below the available S4ULs Assessment Criteria applied.

148. Of the heavy metals analysed, only lead were detected at elevated concentrations in 2 of the 34 samples analysed, with a maximum concentration of 980mg/kg being determined, compared to the S4ULof 680mg/kg.

149. Within the range of organic substances analysed, all PAHs were present at low concentrations, significantly below the assessment criteria. All fractions of Speciated total petroleum hydrocarbons lighter than C10 and including BTEX were below the limits of analysis detection. Although some heavier hydrocarbon fractions were present, they remained significantly below the S4ULs assessment criteria applied.

150. Of the nineteen samples scheduled for VOC analysis, thirteen did not contain any detectable VOCs. In the remaining samples, five contained detectable concentrations of tetrachloroethene (maximum 42ug/kg detected), one contained elevated T-Butylbenzene (maximum 26ug/kg detected) and one contained elevated 1,2,3 trichlorobenzene at only 1.00m depth in TP04-TM (maximum 14ug/kg detected). The remaining 57 VOCs analysed all remained below detection levels for each of the nineteen samples. The presence of any VOCs is of concern to human health, especially where present at shallow depth.

151. The four samples that were scheduled for secondary asbestos quantification were from the upper site level only, three from BH02-TM, between 1.00m and 6.00m depth and one from BH03-TM at 4.00m depth. Several types of asbestos were present; Crysotile, Anthophylitte and the more hazardous Amosite. The percentages of asbestos containing fibres within the soil matrix ranged between, 0.012% at 1.00m, 0.021 at 2.50m, 0.005% at 4.00m and 0.38% at 6.00m. Assessing the risk to human health of asbestos within soils is complicated and has recently been the subject of extensive research by CIRIA. Currently, there is no Soil Guideline Value (SGV) for asbestos, so most human health risk assessments use the 0.001% limit. On this basis, the landfill contains elevated asbestos contamination hotspots, not visible to the naked eye, which could harm human health.

152. As previously discussed in Section 1.3, elevated Ammoniacal Nitrogen concentrations in groundwater and leachates are of particular relevance to this assessment. The source of Ammonia contamination is not known, but is probably due to illicit historic disposal of fertilisers within the landfill. The main local problem of ammonia released into air is the unpleasant odour, which is detectable even at low concentrations. At particularly high concentrations, it can also harm vegetation. The harm caused by ammonia in water bodies is more serious, because it is very toxic to aquatic organisms. Low concentrations of ammonia in soil are natural and actually essential for plant nutrition. Over-fertilisation can however lead to excessive concentrations, which result in leaching to water bodies. Exposure to Ammonia at environmental concentrations is unlikely to have adverse effects on human health. However, exposure to high concentrations could cause irritation of eyes, nose and throat, as well as burning the skin where there is direct contact.

153. There are no published S4ULs for Ammonia, but the concentrations determined during analysis varied significantly, confirming hotspots of Ammonia contamination to be present within the landfill. Of the 34 samples analysed, Ammonia was below the limit of detection of 0.5mg/kg in 16. In 12 samples it was present at concentrations greater than 1.0mg/kg. The five highest concentrations determines may be summarised as follows; 5.8mg/kg in TP03-TM at 1.00m, 71mg/kg in BH02-TM at 2.5m, 580mg/kg in BH02-TM at 4.0m, 440mg/kg in BH02-TM at 9.0m and 120mg/kg in BH02-TM at 15.0m. These results indicate a significant Ammonia hotspot in the vicinity of BH02-TM and TP03-TM, at the slope crest. It is also worthy of note that the sample from BH02-TM at 15m was taken 5metres below the base of the proved Made Ground deposits.

7.3 Potentially Contaminated Groundwater

154. During the second round of post fieldwork monitoring on *date*, groundwater samples were obtained from the standpipes in BH1, BH2 and BH3. The samples were analysed for a range of contaminants, including Ammoniacal Nitrogen, which is of specific concern to the Environment Agency, in order to assess the present contaminative condition of groundwater beneath the site.

155. A summary of the groundwater quality laboratory testing results are presented in Table 7.3, which also includes a comparison of the results with the most conservative of Freshwater Environmental Quality Standards (EQS) assessment levels and UK Drinking Water Standards (DW) as available.

Table 7.3 Groundwater Review of Analysis –Tuddenham St Martin

Determinand	Number of Tests	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Number Samples exceeding criteria
As (Dissolved)	3	0.0002	mg/l	0.026	0.01 (DW)	2
B (Dissolved)	3	0.05	mg/l	2		0
Cd (Dissolved)	3	0.00002	mg/l	0.00065	0.005 (DW)	0
Cr (Dissolved)	3	0.001	mg/l	0.004	0.05 (DW)	0
Cu (Dissolved)	3	0.0005	mg/l	0.0011	2.0 (DW)	0
Pb (Dissolved)	3	0.0003	mg/l	0.0028	0.01 (DW)	0
Hg (Dissolved)	3	0.00005	mg/l	Below LOD	0.001 (DW)	0
Ni (Dissolved)	3	0.001	mg/l	0.051	0.02 (DW)	1
Se (Dissolved)	3	0.0005	mg/l	0.0038	0.01 (DW)	0
Zn (Dissolved)	3	0.002	mg/l	0.071	5 (DW)	0
Cyanide(Total)	3	0.01	mg/l	Below LOD	0.05 (DW)	0
Ammoniacal nitrogen	3	0.05	mg/l	270	0.015 (EQS)	3
Biochemical Oxygen Demand (Allyl Thiourea)	3	1	mg/l	6		
pH	3			Range: 7.7 to 7.9		
Chemical Oxygen Demand	3	20	mg/l	89		
Phenols(Mono)	3	0.02	mg/l	Below LOD	0.0077 (EQS)	0
Chloride	3	1	mg/l	170	250 (DW)	0
Nitrate	3	0.5	mg/l	110	50 (DW)	0
Sulphate	3	0.5	mg/l	1000	250 (DW)	2
Nitrite	3	0.1	mg/l	0.9	0.01 (EQS)	EQS below LOD
Total Hardness expressed as CaCO3	3	10	mg/l	850		
TPH (C10-C40)	3	20	ug/l	460		
Naphthalene	3	0.01	ug/l	0.12	2.4 (EQS)	0
Acenaphthylene	3	0.01	ug/l	Below LOD	5.8 (EQS)	0
Acenaphthene	3	0.01	ug/l	0.15	5.8 (EQS)	0
Fluorene	3	0.01	ug/l	0.11	2.1 (EQS)	0
Phenanthrene	3	0.01	ug/l	0.09	3 (EQS)	0
Anthracene	3	0.01	ug/l	0.05	0.1 (EQS)	0
Fluoranthene	3	0.01	ug/l	0.05	0.1 (EQS)	0
Pyrene	3	0.01	ug/l	0.04	0.04 (EQS)	0
Benzo(a)Anthracene	3	0.01	ug/l	Below LOD	0.018 (EQS)	0

Determinand	Number of Tests	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Number Samples exceeding criteria
Chrysene	3	0.01	ug/l	Below LOD	0.01 (EQS)	0
Benzo(b)fluoranthene	3	0.01	ug/l	Below LOD	0.1 (DW)	0
Benzo(k)fluoranthene	3	0.01	ug/l	Below LOD	0.1 (DW)	0
Benzo(a)Pyrene	3	0.01	ug/l	Below LOD	0.01 (DW)	0
Indeno(123-cd)Pyrene	3	0.01	ug/l	Below LOD	0.1 (DW)	0
Dibenzo(ah)Anthracene	3	0.01	ug/l	Below LOD	0.01 (DW)	0
Benzo(ghi)Perylene	3	0.01	ug/l	Below LOD	0.01 (DW)	0
PAH(total)	3	0.01	ug/l	0.6		

156. The majority of contaminants analysed remained below the conservative target concentrations applied, with only slight exceedences of dissolved Arsenic, Nickel and soluble sulphate in one, or two of the samples. The pH range of the groundwater is near neutral.

157. Ammoniacal Nitrogen is notable as the most significant constituent of the groundwater, with concentrations ranging from 0.22mg/l or less in BH01-TM and BH03-TM, to 270mg/l in BH02-TM, compared to the freshwater EQS of 0.015mg/l .

158. In order to assess the leachability of contaminants within the landfill materials and soils encountered which may impact on future groundwater quality, leachate for 18 soil samples was prepared and analysed for the same water quality suite as the groundwater samples. A summary of the leachate laboratory testing results are presented in the table below, which also includes a comparison of the results with the most conservative of Freshwater EQS assessment levels and UK DW Standards as available.

Table 7.4 Leachate Review of Analysis –Tuddenham

Determinand	Number of Tests	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Number Samples exceeding criteria
As (Dissolved)	18	0.0002	mg/l	0.015	0.01 (DW)	5
B (Dissolved)	18	0.05	mg/l	.23		0
Cd (Dissolved)	18	0.00002	mg/l	0.0012	0.005 (DW)	0
Cr (Dissolved)	18	0.001	mg/l	0.008	0.05 (DW)	0
Cu (Dissolved)	18	0.0005	mg/l	0.039	2.0 (DW)	0
Pb (Dissolved)	18	0.0003	mg/l	0.0036	0.01 (DW)	0
Hg (Dissolved)	18	0.00005	mg/l	Below LOD	0.001 (DW)	0
Ni (Dissolved)	18	0.001	mg/l	0.034	0.02 (DW)	3
Se (Dissolved)	18	0.0005	mg/l	0.003	0.01 (DW)	0
Zn (Dissolved)	18	0.002	mg/l	0.089	5 (DW)	0
Cyanide(Total)	18	0.01	mg/l	Below LOD	0.05 (DW)	0
Ammoniacal nitrogen	18	0.05	mg/l	92	0.5 (DW)	5

Determinand	Number of Tests	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Number Samples exceeding criteria
Biochemical Oxygen Demand (Allyl Thiourea)	18	1	mg/l	4		
pH	18			Range: 7.5 to 8.3		
Chemical Oxygen Demand	18	20	mg/l	190		
Phenols(Mono)	18	0.02	mg/l	0.03	0.0077 (EQS)	EQS below LOD
Chloride	18	1	mg/l	34	250 (DW)	0
Nitrate	18	0.5	mg/l	14	50 (DW)	0
Sulphate	18	0.5	mg/l	1200	250 (DW)	4
Nitrite	18	0.1	mg/l	0.8	0.01 (EQS)	EQS below LOD
Total Hardness expressed as CaCO3	18	10	mg/l	1400		
TPH (C10-C40)	18	20	ug/l	750		
Naphthalene	18	0.01	ug/l	Below LOD	2.4 (EQS)	0
Acenaphthylene	18	0.01	ug/l	Below LOD	5.8 (EQS)	0
Acenaphthene	18	0.01	ug/l	Below LOD	5.8 (EQS)	0
Fluorene	18	0.01	ug/l	0.03	2.1 (EQS)	0
Phenanthrene	18	0.01	ug/l	0.04	3 (EQS)	0
Anthracene	18	0.01	ug/l	Below LOD	0.1 (EQS)	0
Fluoranthene	18	0.01	ug/l	0.05	0.1 (EQS)	0
Pyrene	18	0.01	ug/l	0.04	0.04 (EQS)	0
Benzo(a)Anthracene	18	0.01	ug/l	Below LOD	0.018 (EQS)	0
Chrysene	18	0.01	ug/l	Below LOD	0.01 (EQS)	0
Benzo(b)fluoranthene	18	0.01	ug/l	Below LOD	0.1 (DW)	0
Benzo(k)fluoranthene	18	0.01	ug/l	Below LOD	0.1 (DW)	0
Benzo(a)Pyrene	18	0.01	ug/l	Below LOD	0.01 (DW)	0
Indeno(123-cd)Pyrene	18	0.01	ug/l	Below LOD	0.1 (DW)	0
Dibenzo(ah)Anthracene	18	0.01	ug/l	Below LOD	0.01 (DW)	0
Benzo(ghi)Perylene	18	0.01	ug/l	Below LOD	0.01 (DW)	0
PAH(total)	18	0.01	ug/l	0.08		

159. Mirroring the groundwater analysis results, the majority of contaminants analysed remained below the conservative target concentrations applied, with only slight exceedences of dissolved Arsenic, Nickel and soluble sulphate in up to five samples. The pH range of the groundwater is near neutral.

160. Ammoniacal Nitrogen is also notable as the most significant constituent of the leachates analysed, with a maximum concentration of 92mg/l being determined., indicating the potential for further future contamination of groundwater by Ammoniacal Nitrogen leached from the landfill materials.

7.4 Potentially Contaminated Surface Water

161. At commencement of the Phase 2 investigation, surface water quality sampling for six existing Environment Agency monitoring points in close proximity to the River Fynn was undertaken by REC Limited (Ref: FYN011, FYN013, FYN014, FYN016, FYN018 and FYN020 at Tuddenham Bridge).

162. The principal objective of the surface water sampling was to provide baseline data prior to intrusive investigation and cable route construction within Tuddenham St Martins Landfill. It is proposed that following completion of construction, this sampling and analysis exercise is repeated to provide quantitative data on the short term impact (if any) of the cable route construction activities, on spring and river water quality.

163. Monitoring actions associated with the Contaminated Land Remediation Statement prepared by the Environment Agency include comparison of Ammonia concentrations with the Water Framework Directive river quality GOOD standard of 0.6mg/l. The presence of 'elevated Ammonia in leaching from soils on site and then migration via springs to the controlled waters in the River Fynn', is one of the two significant pollutant linkages (SPLs) on which the Part IIA designation of Tuddenham Landfill as Contaminated Land was based.

Table 7.5 Surface Water Review of Analysis –Tuddenham

Determinand	Number of Sampling Points	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Samples exceeding criteria
Ammonia as NH3	6	0.05	mg/l	50	0.6 (WFD Good River)	3 spring samples; FYN 013, 014 and 016.
Biochemical Oxygen Demand (Allyl Thiourea)	6	1	mg/l	6		
pH	6			Range 7.3 to 8.2		
Chemical Oxygen Demand	6	20	mg/l	60		
Sulphate	6	0.5	mg/l	380	400 (EQS)	
Total Hardness expressed as CaCO3	6	10	mg/l	730		
VOCs	6	1	ug/l	6		Majority of results below LOD. Two spring samples; FYN 013, and 014, contain slightly elevated concentrations of up to 3 of the 60 determinands analysed.

164. All three samples obtained from the River Fynn contained Ammonia concentrations below the WFD target concentration of 0.6 mg/l, the result at Tuddenham Bridge was 0.12mg/l. However, the results from all three spring water samples, located between the Landfill and the River Fynn all exceeded this target concentration, significantly elevated results of 46mg/l and 50mg/l were obtained for the two points closest to the landfill; FYN013 and FYN014.

7.5 Hazardous Ground Gases

165. Post fieldwork gas monitoring of standpipes installed in all three boreholes was carried out on four occasions between 14th June and 26th July 2016 by REC, as discussed in Section 4.3. One visit was during a period of low atmospheric pressure of less than 1000mb. The standpipe response zones extended from 1.00m depth throughout the Made Ground deposits and into the underlying sands of the Red Crag Formation.

166. Initially peak and steady state gas flow were measured. The peak and steady concentrations of three gases, (Oxygen, Methane and Carbon Dioxide) were then recorded by pumping the standpipe gas through the monitor. The results are included in Appendix 3.

167. On each monitoring visit, no detectable levels of Methane were recorded. Elevated concentrations of Carbon Dioxide were recorded in all three boreholes on at least one visit, although it is noted that the concentrations in BH02-TM and BH03-TM, fluctuated significantly and within the range of only 0.1% to 1.2% during the last two monitoring rounds. The maximum concentration of Carbon Dioxide recorded was 16.1% volume of gas in BH02-TM, on the first monitoring visit. Oxygen levels were correspondingly depleted, with a minimum value of 1.0% being recorded. Only one gas flow of 0.1l/hr was recorded at the location of BH03-TM on the second visit.

168. Based on the guidelines of CIRIA C665, the soil gas investigation to date has identified a maximum Carbon Dioxide concentration of 16.1% with a worst-case flow rate of 0.1 l/hr. The gas screening value (GSV) can be calculated as:

- GSV = 0.16 x 0.1 = 0.016 l/hr

169. Characteristic situation 1 has an upper GSV threshold of 0.07 l/hr; typical carbon dioxide and methane concentrations should also not exceed 5% and 1% respectively. As the carbon dioxide concentration has exceeded 5% in at least one standpipe on all four visits, the site can be classified as Characteristic Situation 2. It is noted that 'Typical Made Ground' is documented as being a usual source of this level of gas generation, which corresponds with the known ground model of the site.

170. The guidance of CIRIA C665: Assessing risks posed by hazardous ground gases to buildings - 2007, focusses on assessing the risks posed by hazardous ground gases to buildings, which is not directly applicable to the proposed development. However, the classification of the site as Characteristic Situation 2 indicates there is potentially a risk of encountering elevated carbon dioxide during construction of the cable route corridor, with the potential for carbon dioxide to accumulate in confined spaces, such as the base of a trench, or junction chamber.

171. In addition to the post fieldwork standpipe monitoring for Oxygen, Methane and Carbon Dioxide, the presence of any volatile gases within the top 2.5m of the landfill, which could also pose a risk to the health of construction workers, was investigated during fieldwork. Insitu testing of samples using a Photo Ionisation Detector (PID meter) was performed at metre intervals in all six trial pits, The results of all tests were 0ppm, with no volatile gases being detected. Therefore no precautionary measures to protect construction worker exposure to VOCs will be required.

7.6 Waste Classification

172. The Waste Acceptance Criteria (WAC) covers the minimum testing requirements that need to be met for the disposal of waste to landfill. The waste acceptance criteria (limits) depend upon the classification of the waste. The three main classifications are:

- Inert waste
- Stable non-reactive waste
- Hazardous waste

173. Five WAC tests were performed within the landfill deposits at shallow depth to represent the materials to be excavated in construction of the cabling trenches. The results have been compared against the criteria for each of the three classifications above and summarised in Table 7.6 below.

Table 7.6 Waste Classification Review of Analysis –Tuddenham

Sample Reference	Inert Categorisation Exceedences	Conservative Classification
TP01-TM at 0.50m (Lower site level – west)	• None	Inert
TP03-TM at 1.00m (Upper site level – slope crest)	• Flouride	Stable non-reactive
TP04-TM at 0.50m (Upper site level – east)	• Flouride	Stable non-reactive
TP05-TM at 0.50m (Upper site level – slope crest)	• Antimony	Stable non-reactive
TP05-TM at 1.00m (Upper site level – slope crest)	• Antimony	Stable non-reactive

174. The majority of the determinants within the testing suite and all soil test results remained within the Inert categorisation. Within the leachate results, two samples exceeded the Inert criteria for Antimony only and two samples exceeded the Inert criteria for Flouride only. Only one of the five samples from TP01 at the lower site level was directly classified as Inert waste, without any exceedences.

7.7 Revised Conceptual Model

175. The factual data obtained during the Phase 2 investigation has been evaluated and interpreted, to identify potential contamination source-pathway–receptor linkages applicable to the site and the proposed development.

176. Previous development of the site at Tuddenham St Martins has left a legacy of Made Ground materials. Made Ground (Landfill) deposits were encountered at each of the nine exploratory hole locations during this Phase 2 investigation and proved to extend to depths of between 0.50m (BH01-TM) and 10.00m (BH02-TM). The Made Ground deposits encountered were inherently variable in composition. Detritus fragments generally included; brick, wire, concrete, wood, plastic, metal and glass, with lesser proportions of asphalt, clinker and pottery. The detritus fragments were predominantly within a brown sand matrix, although some localised variations of silt, gravel, or clay matrices were also noted. No odours were noted to be emanating from the Made Ground deposits and none of the insitu PID tests carried out at metre intervals within the trial pits recorded any VOC gases to be present.

177. As anticipated, the Made Ground deposits encountered at the lower site level (BH01, TP01 and TP02 refer), were generally thinner than the upper site level, ranging from 0.50m in BH01 and TP02, to a maximum thickness of 1.60m of Made Ground proved in TP01. The reduced level for the base of Made Ground deposits in the lower site level varied by less than 1m, being between around 30.70mAOD and 31.70mAOD. Within the upper site level, the maximum thickness of Made Ground deposits proved by BH02-TM and BH03-TM, indicated the base of the landfill to be at a reduced level of 29.70mAOD and 28.70mAOD respectively. However, at this upper level, the ground conditions encountered in TP05 and TP06 indicate that the thickness of Made Ground may thin towards the eastern site boundary, proved to 1.90m depth in TP05 and 0.80m depth in TP06, which for TP06 corresponds to a reduced level for landfill base of just above 39mAOD.

178. The chemical analysis of groundwater and leachate samples within the landfill has confirmed both the presence of elevated Ammonia within groundwater and the potential for future leachates to contain elevated Ammonia. The samples from springs, discharging into the River Fynn also contained elevated Ammonia concentrations. The following two significant pollutant linkages (SPLs) determining the site to be contaminated land have therefore been confirmed by the Phase 2 investigation and the elevated risk to controlled waters remains.

- SPL 1: Leaching of ammonia-N from soils on the site into controlled waters (groundwater) contained within the Red Crag aquifer
- SPL 2: Leaching of ammonia-N from soils on the site and then migration via springs to controlled waters in the River Fynn

179. The revised conceptual model incorporating the current investigation findings is reproduced below:

Table 7.7 Revised Conceptual Model –Tuddenham

Contamination Linkage Elements			Qualitative Risk Assessment			Managing Risk
Sources	**Pathways**	**Receptors**	**Complete Linkage**	**Severity**	**Risk Rating**	**Action required**
Potentially contaminated soils	Inhalation/ Ingestion/ Dermal Contact	Human Receptors - site users following construction	Possible	Moderate	Medium	Made Ground deposits containing isolated hotspots of asbestos anticipated. Appropriate PPE to be worn when working with Made Ground materials. Good standard of site hygiene to be maintained.
	Inhalation/ Ingestion/ Dermal Contact	Human Receptors- construction workers	Likely	Moderate	Medium to High	
	Direct contact/ Root uptake	Flora and Fauna	Likely	Low	Low	
Potentially contaminated ground water	Flow off site	Surface Waters	Likely	Moderate to High	Medium to High	Ammonia contamination confirmed by Phase 2 baseline assessment. This risk will remain during construction, but should not be affected by the development. No action required during construction.
	Net deterioration of Groundwater	Groundwater in larger area	Likely	Moderate to High	Medium to High	
Hazardous ground gas (methane and carbon dioxide)	Inhalation, migration and accumulation in confined areas	Human Receptors – construction workers and site end users	Possible	Low	Medium	Gas monitoring identified site as Characteristic Situation 2, entry into confined spaces, including trenches to be avoided.

8 Culpho Hall Geoenvironmental Assessment

8.1 Context

180. During preparation of the Phase 1 Desk Study Report for this site, an Initial Conceptual Model was developed and preliminary risk assessment applied. Following the Phase 1 Desk Study stage of investigation, the potential environmental risks associated with the proposed redevelopment of the site were considered to be low to medium if a landfill was present. The Phase 1 Desk Study research could not confirm the presence of a landfill and uncertainty remained.

Table 8.1 Initial Conceptual Model – Culpho Hall Landfill

Contamination Linkage Elements			Qualitative Risk Assessment			Managing Risk
Sources	**Pathways**	**Receptors**	**Complete Linkage**	**Severity**	**Risk Rating**	**Action required**
Potentially contaminated soils	Inhalation/ Ingestion/ Dermal Contact	Human Receptors - site users following construction	Possible	Moderate	Low to Medium	The location and nature of any Made Ground deposits is not known. Sample and analyse soils on a non-targeted grid across the cable route to obtain baseline data during Phase 2 investigation.
	Inhalation/ Ingestion/ Dermal Contact	Human Receptors- construction workers	Possible	Moderate	Low to Medium	Appropriate PPE to be worn when working with Made Ground materials. Good standard of site hygiene to be maintained.
	Direct contact/ Root uptake	Flora and Fauna	Possible	Low	Low	
Potentially contaminated ground water	Flow off site	Surface Waters	Likely	Moderate	Low to Medium	Sample and analyse groundwater if encountered to obtain baseline data during Phase 2 investigation.
	Net deterioration of Groundwater	Groundwater in larger area	Likely	Moderate	Low to Medium	
Hazardous ground gas (methane and carbon dioxide)	Inhalation, migration and accumulation in confined areas	Human Receptors – construction workers and site end users	Possible	Low	Low	Gas monitoring programme to confirm low risk recommended during Phase 2 investigation.

181. The geoenvironmental focus of this investigation phase was to obtain data relevant to the initial contamination hypotheses. The data has been used to assess the validity of the initial assessment, prepare a Revised Conceptual Model and advise the proposal of appropriate mitigation measures during construction where required.

182. As previously noted, no evidence of former landfill activity within the site was encountered during the trial pitting completed, with no Made Ground, i.e. potentially contaminated soils being encountered.

183. As summarised in Section 5.3, a limited number of samples were scheduled for environmental analysis, to confirm on site assessment and prove that the material encountered is uncontaminated and with negligible potential to contaminate underlying groundwater.

8.2 Discussion of Environmental Analysis Results

8.2.1 Soils

184. The soil samples were scheduled to be analysed in the laboratory as detailed in Section 5.2.1. The testing suite included a range of commonly occurring contaminants which could be compared to current published soil LQM/CIEH S4ULs (suitable for use levels) .

185. The proposed cable route construction has been assessed using the commercial generic land use scenario. This is the most sensitive CLEA categorisation applicable to the proposed development relating to the receptor of long term human health.

186. A comparison of baseline data obtained from laboratory testing with available assessment criteria is tabulated below. For hydrocarbons, where the percentage of Soil Organic Matter affects the S4ULs, a conservative value of 1% has been used.

Table 8.2 Review of Soils Analysis –Culpho Hall

Test Description	Number of Tests	Assessment Criteria	Maximum Result (mg/kg, unless otherwise stated)	Number of Samples Exceeding Assessment Criteria	Comment
Arsenic	9	640	7	0	
Boron	9	240000	<1	0	
Cadmium	9	190	0.1	0	
Chromium (total)	9	8600	11	0	
Copper	9	68000	13	0	
Lead	9	630	17	0	
Mercury	9	25.8	<1	0	
Nickel	9	980	11	0	
Zinc	9	730000	32	0	
pH (range)	9		Range: 7.2 – 8.4		
Water soluble sulphate (as SO_4) (g/l)	9		<0.01		
Organic matter (%)	9		1.1		
PAH	9			0	All total and speciated results below Limit of Detection (LOD)
Phenol	9	760	<1	0	
Cyanide (total)	9		<1	0	
Asbestos Bulk Identification	9		Not detected	0	Asbestos fibres not detected in any sample
Total Petroleum	9			0	All results below

Test Description	Number of Tests	Assessment Criteria	Maximum Result (mg/kg, unless otherwise stated)	Number of Samples Exceeding Assessment Criteria	Comment
Hydrocarbons					Limit of Detection (LOD)
TPH CWG with BTEX (C6 to C35):	9			0	All speciated results below Limit of Detection (LOD)
Cyanide (free)	9		<1	0	
Selenium	9	1200	<3	0	
Vanadium	9	9000	37	0	
Chloride	9		11	0	
Leachate Preparation	3		N/A		See Table 8.3 for results

187. All results were below the S4ULs assessment criteria applied.

188. The results for all hydrocarbons were below the limit of detection.

189. No asbestos fibres were detected.

190. Some heavy metals were present at natural background concentrations, which it is noted would also be below the more stringent S4ULs for the the CLEA generic land use scenario of residential gardens with plant uptake.

8.2.2 Leachates

191. A summary of the leachate laboratory testing results are presented in the table below, which also includes a comparison of the results with the most conservative of Freshwater Environmental Quality Standards (EQS) assessment levels and UK Drinking Water Standards (DW) as available.

Table 8.3 Review of Leachate Analysis –Culpho Hall

Determinand	Number of Tests	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Number Samples exceeding criteria
As (Dissolved)	3	0.0002	mg/l	0.0043	0.01 (DW)	0
B (Dissolved)	3	0.05	mg/l	Below LOD		0
Cd (Dissolved)	3	0.00002	mg/l	0.00003	0.005 (DW)	0
Cr (Dissolved)	3	0.001	mg/l	0.004	0.05 (DW)	0
Cu (Dissolved)	3	0.0005	mg/l	0.0024	2.0 (DW)	0
Pb (Dissolved)	3	0.0003	mg/l	0.0013	0.01 (DW)	0
Hg (Dissolved)	3	0.00005	mg/l	Below LOD	0.001 (DW)	0
Ni (Dissolved)	3	0.001	mg/l	0.001	0.02 (DW)	0
Se (Dissolved)	3	0.0005	mg/l	Below LOD	0.01 (DW)	0

Determinand	Number of Tests	LOD (Limit of Detection)	Units	Maximum result	Target Concentrations	Number Samples exceeding criteria
Zn (Dissolved)	3	0.002	mg/l	0.006	5 (DW)	0
Cyanide(Total)	3	0.01	mg/l	Below LOD	0.05 (DW)	0
Ammoniacal nitrogen	3	0.05	mg/l	0.11	0.5 (DW)	0
Biochemical Oxygen Demand (Allyl Thiourea)	3	1	mg/l	3		
pH	3		Range: 6.9 – 7.1			
Chemical Oxygen Demand	3	20	mg/l	48		
Phenols(Mono)	3	0.02	mg/l	Below LOD	0.0077 (EQS)	0
Chloride	3	1	mg/l	2	250 (DW)	0
Nitrate	3	0.5	mg/l	1.1	50 (DW)	0
Sulphate	3	0.5	mg/l	0.5	250 (DW)	0
Nitrite	3	0.1	mg/l	Below LOD	0.01 (EQS)	0
Total Hardness expressed as CaCO3	3	10	mg/l	Below LOD		
TPH (C10-C40)	3	20	ug/l	200		
PAH	3	0.01	ug/l		All total and speciated results below Limit of Detection (LOD)	0

192. The leachate test results were below all target concentrations, with many determinand concentrations being below the limit of detection.

8.3 Revised Conceptual Model

193. The factual data obtained during the Phase 2 investigation has been evaluated and interpreted, to identify potential contamination source-pathway–receptor linkages applicable to the site and the proposed development.

194. This Phase 2 intrusive investigation did not identify any evidence of this section of the cable route was formerly used as a landfill. Insitu natural drift deposits were consistently encountered underlying topsoil at all exploratory hole locations throughout the site.

195. Following the Phase 2 investigation, it is concluded with certainty that this site is an area of low potential contamination risk and should no longer to be classified as a potential landfill area.

196. The revised conceptual model incorporating the current investigation findings is reproduced below:

Table 8.4 Revised Conceptual Model –Culpho Hall

Contamination Linkage Elements			Qualitative Risk Assessment			Managing Risk
Sources	**Pathways**	**Receptors**	**Complete Linkage**	**Severity**	**Risk Rating**	**Action required**
Potentially contaminated soils	Inhalation/ Ingestion/ Dermal Contact	Human Receptors - site users following construction	Possible	Moderate	Low	Phase 2 investigation confirmed the site to be Greenfield, with no Made Ground i.e. Landfill deposits encountered.
	Inhalation/ Ingestion/ Dermal Contact	Human Receptors- construction workers	Possible	Moderate	Low	
	Direct contact/ Root uptake	Flora and Fauna	Possible	Low	Low	
Potentially contaminated ground water	Flow off site	Surface Waters	Likely	Moderate	Low	
	Net deterioration of Groundwater	Groundwater in larger area	Likely	Moderate	Low	
Hazardous ground gas (methane and carbon dioxide)	Inhalation, migration and accumulation in confined areas	Human Receptors – construction workers and site end users	Possible	Low	Low	

9 Tuddenham St Martin Conclusions and Mitigation

9.1 Conclusions

197. The Phase 2 investigation has confirmed construction of the cable corridor route at this location will be through Landfill waste (Made Ground) deposits. It would be prudent to plan construction works anticipating the Landfill waste materials within the investigated landfill boundaries to extend for the whole 110m length of the route corridor, but thinning to less than 1m thick within 10m of both eastern and western site boundaries.

198. The cables will therefore be laid within waste deposits, which are present to a maximum depth of 10mbgl.

199. The topography of the cable route is undulating, in places steep, with a potential fall in level of around 10m from east to west.

200. Although inherently variable, the nature of the waste encountered was predominantly building rubble within a sand, or clay matrix. Some large fragments of rubble were encountered but no difficulty in excavation, or boring, due to the presence of obstructions was noted during the investigation. The visible waste detritus included; brick, wire, concrete, wood, plastic, metal and glass, with lesser proportions of asphalt, clinker and pottery. No voids within the waste were noted, but low Standard Penetration Test 'N' values indicated the waste to be very loose near the crest of the slope in BH2, down to around 4m depth.

201. The chemical test results of soils encountered during the investigation generally remained below the S4ULs assessment criteria for the receptor of long term human health, when considering a generic commercial land use scenario. However, protection for construction workers with short term exposure to the waste also needs to be considered.

202. Asbestos fibres, which had not been visible to the naked eye, were proved by analysis to be present in four samples. Secondary quantitative analysis of these four samples determined a maximum percentage of fibres within soil matrix of 0.38%. The types of fibres present included the most hazardous Amosite in addition to Chrysotile and Anthophylitte.

203. The insitu PID monitoring results in the trial pits for volatile gases were all zero. However, post fieldwork monitoring of the three borehole standpipes recorded some elevated carbon dioxide to be present associated with depleted oxygen, no methane was present.

204. The significant pollutant linkages (SPLs) identified by the Environment Agency within the Remediation Strategy for the site, relate to leaching of Ammonia to groundwater and via springs to the River Fynn. The potential for remobilisation of existing contamination would be greatest if the cable trench intersects with the groundwater table. However, the groundwater table has been monitored at all three borehole locations to be within the Red Crag Formation, the highest water level depths recorded ranged from 6.12m (BH01-TM) to13.15m (BH03-TM). The monitored water table was at approximately 26mAOD, i.e. at least 2.5m below the base of the Made Ground deposits and even further below the proposed trench excavations.

205. No perched water tables were encountered during investigation and it is anticipated that groundwater will not be encountered during construction. Obviously some percolation of rainwater from surface through the uncapped landfill surface will continue. Following completion of the works, it is also expected that groundwater levels will remain below the depth of the cable trenches in the long term.

206. The chemical analysis of groundwater and leachate samples within the landfill has confirmed both the presence of elevated Ammonia within groundwater and the potential for future leachates to contain elevated Ammonia. The samples from springs, discharging into the River Fynn also contained elevated Ammonia concentrations above the WFD threshold for Good River Quality. The two significant pollutant linkages (SPLs) determining the site to be contaminated land have therefore been confirmed by the Phase 2 investigation and the elevated risk to controlled waters remains. It is however difficult to identify a mechanism where the proposed cable route construction, principally comprising shallow trenching work, would exacerbate or even directly affect these two SPLs.

207. Categorisation of five soil samples as waste determined two to be inert and three to be stable non-reactive, with only minor exceedance of fluoride or antimony above the inert limits.

208. Within any landfill there are hotspots of contamination e.g. in this investigation, a hotspot of Ammonia contamination was identified at the location of BH02-TM, towards the slope crest. There may be further hotspots of contamination between exploratory hole locations which have not been identified during the investigation. The worst case conditions identified by the investigation have therefore been used when considering appropriate mitigation measures for construction through this contaminated land.

9.2 Mitigation

209. Whilst it is not anticipated that the proposed construction works will impact on the existing Environment Agency SPLs associated with controlled waters, some minor modification of the default standard cable route construction through the landfill will be required, as outlined in the following paragraphs, however not specialist techniques are considered necessary.

210. Even though the cable route will remain above the groundwater table, modifications of the default standard cable route construction through the landfill will be a suitable precautionary approach, to protect the cables and prevent the cable trench becoming a conduit of surface water runoff, which could possibly increase leachate generation. These options include, ducting of the cables within the trenches for protection and surrounding the cables in relatively impermeable cement bound sand (CBS), or bentonite, rather than sand.

211. The identification of the waste being poorly compacted in places, particularly at shallow depth raises some geotechnical concerns regarding differential settlement of the cabling in the long term as the waste continues to degrade and potentially settle under its own weight. Consideration of cable tolerance for movement and the suitable positioning of jointing chambers through the landfill will be considered during final construction design. If acceptable cable tolerance is likely to be exceeded, it may be appropriate to incorporate a basal layer of geogrid within the trenches, to bridge and redistribute any localised settlement. Construction workers should minimise direct contact with the waste materials, including inhalation of dust. Appropriate PPE would include overalls and gloves. There is potential for asbestos fibre contamination to be encountered and it is recommended that licenced asbestos specialists carry out a suitable programme of air quality monitoring during excavation and backfilling works.

212. The classification of the site as Characteristic Situation 2 (CIRIA C665), indicates there is potentially a risk of encountering elevated carbon dioxide during construction of the cable route corridor, with the potential for carbon dioxide to accumulate in confined spaces, such as the base of a trench, or junction chamber. Person entry into trenches/excavations/confined spaces within the landfill should be avoided where possible. Precautionary measures to protect construction workers could comprise personal on site gas monitoring if trenches are entered.

213. The suitability of the waste material to be reused as backfill for the top metre of cable trenches has been assessed and is considered suitable, once any large fragments (cobbles and boulders) have been removed. This would minimise off-site disposal of waste materials and the Environment Agency have confirmed (letter from M.Barrell 10th October 2016) that the backfilling the trench with the material excavated would not require an Environmental Permit.

214. Waste categorisations have been completed so that quotations for off-site disposal of waste to another landfill may be obtained for excess trench materials. The Environment Agency have indicated (letter from M.Barrell 10th October 2016) that the excess trench materials would be considered as waste and should be removed from site.

215. Following construction completion it is recommended that a further round of surface water sampling and analysis for the six existing Environment Agency monitoring points, between the landfill and the River Fynn is repeated to provide quantitative data on the short term impact (if any) of the cable route construction activities, on spring and river water quality. It is also noted that if the existing borehole standpipes can be protected during construction, they could be subsequently dipped to confirm groundwater level fluctuations and sampled for groundwater quality analysis.

216. Once construction is completed and the post construction water quality analysis confirms that the existing groundwater quality has not deteriorated due to construction activities, no ongoing liabilities regarding the mitigation of contaminated land have been identified.

10Culpho Hall Conclusions and Mitigation

10.1 Conclusions

217. The Phase 2 investigation has confirmed construction of the cable corridor route at this location will not be through Landfill waste (Made Ground) deposits, but natural ground. As the Phase 1 Desk Study preparation did not identify any conclusive data indicating the presence of a landfill, significant uncertainty remained prior to trial pitting and the investigation findings are not completely unexpected. The listing of a potential landfill at this location on Environment Agency and Council records is likely to be a historic administrative error, probably resulting from a former sand pit or similar being erroneously plotted within the site.

218. The cables will therefore be laid within granular drift deposits of slightly silty slightly gravelly sand, proved to be present to at least 2.5m depth across the site, underlying between 0.30m and 0.50m of Topsoil .

219. Insitu PID monitoring, total and leachate chemical analysis of materials encountered did not identify any contamination.

220. At the lower, far eastern extent of the site (TP10-CH), it is noted that a shallow groundwater table within the depth of trenching may be encountered. A seepage was noted at 1.30m depth, equivalent to a reduced elevation of 24.2mAOD.

221. It is noted that positioning of the Phase 2 investigation trial pits was restricted slightly due to the presence of a badger sett within the site area and the need to maintain a 30m buffer from this sett.

10.2 Mitigation

222. No mitigating measures will be required for contamination and standard construction methodology may be adopted as the site area is confirmed to be greenfield.

11References

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REC Factual Ground Investigation Report: July 2016: East Anglia ONE Offshore Windfarm Site Works Report – Tuddenham St Martin. ID: EA1-CON-R-IBR-1CO101165P1R1

REC Factual Ground Investigation Report: July 2016: East Anglia ONE Offshore Windfarm Site Works Report – Culpho Hall. ID: EA1-CON-R-IBR-1CO101165P2R1

East Anglia ONE Offshore Windfarm Cable Method Statement DCO Requirement 29 (1) (b) Interim for Consultation August 2016. ID: EA1-CON-R-IBR-021238

Appendix 1 Site Location Plans

610000 615000 620000 625000 630000 635000

255000 250000 245000 240000 235000

N

Western
Geo-environmental
Extent

Eastern
Geo-environmental
Extent

SCOTTISHPOWER RENEWABLES

Legend

- EA1 DCO Red Boundary
- Geo-environmental Site Walkover Extents

IBERDROLA Engineering & Construction

FOR INFORMATION

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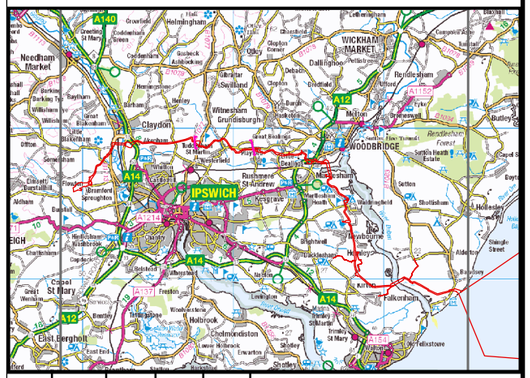

ISSUE	DATE	DRAWN	CHKD	APPD	REVISION NOTES
0A	27/08/15	SF	GM	IM	Internal / External Draft - First draft

DRAWING NUMBER *EA1-GRD-D-IEC-001634 Rev 0A*

COORDINATE SYSTEM BNG
DATUM OSGB 1936
PROJECTION TRANSVERSE MERCATOR
UNITS METRE

PURPOSE *INTERNAL / EXTERNAL DRAFT*

SCALE 1:90,000 (0 — 2,000 — 4,000 m)
ORIGINAL PLOT SIZE A3

PROJECT TITLE *EA ONE*

DRAWING TITLE *CABLE ROUTE*
GEO-ENVIRONMENTAL EXTENTS OVERVIEW

DRAWING ID **1 of 1**
DRAWING PREPARED BY: IBERDROLA Engineering & Construction

Document Path: D:\users\X323769\Documents\East Anglia\ArcMap Drawings\IEC Drawing Names\EA1-GRD-D-IEC-001634 Rev 0A.mxd

620000

250000

N

Western Geo-environmental Extent

9800m
10000m
10200m
10400m
10600m
10800m
11000m
11200m
11400m
11600m
11800m
12000m
12200m
12400m
12600m
12800m
13000m
13200m
13400m
13600m
13800m

Eastern Geo-environmental Extent

14000m
14200m
14400m
14600m

620000

Document Path: D:\users\X323769\Documents\East Anglia\ArcMap Drawings\IEC Drawing Names\EA1-GRD-D-IEC-001635 Rev 0A.mxd

SCOTTISHPOWER RENEWABLES

Legend

- EA1 Trench Centre Line
- EA1 DCO Red Boundary
- EA1 Construction Corridor
- EA1 Cable Route Chainage Markers
- Geo-environmental Site Walkover Extents

IBERDROLA Engineering & Construction

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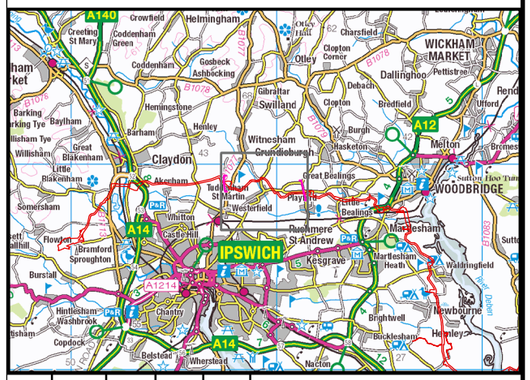

ISSUE	DATE	DRAWN	CHKD	APPD	REVISION NOTES
0A	27/08/15	SF	GM	IM	Internal / External Draft - First draft

DRAWING NUMBER *EA1-GRD-D-IEC-001635 Rev 0A*

COORDINATE SYSTEM BNG
DATUM OSGB 1936
PROJECTION TRANSVERSE MERCATOR
UNITS METRE

PURPOSE *INTERNAL / EXTERNAL DRAFT*

SCALE 1:14,000 (0 250 500 m)
ORIGINAL PLOT SIZE A3

PROJECT TITLE *EA ONE*

DRAWING TITLE *GEO-ENVIRONMENTAL EXTENTS OVERVIEW*

DRAWING ID **1 of 1**
DRAWING PREPARED BY: IBERDROLA Engineering & Construction

Appendix 2 Abstracted Exploratory Hole Location Plans

619200 619400 619600

249400 249200 249000

N

31.8m
37.0m
34.0m
34.4m
30.7m
36.1m
36.6m
LANE
Track
Pond
Bungalow
Gipsy
Drain
1.22m Rh
Pond
Finnlands
Carswood

TP01TM
TP02TM
TP03TM
TP04TM
TP05TM
TP06TM
BH01TM
BH02TM
BH03TM

SCOTTISHPOWER RENEWABLES

LEGEND

- EA1 DCO Boundary
- Construction Corridor
- Tuddenham Trial Pits / Boreholes
- Assumed Extent of Landfill Areas

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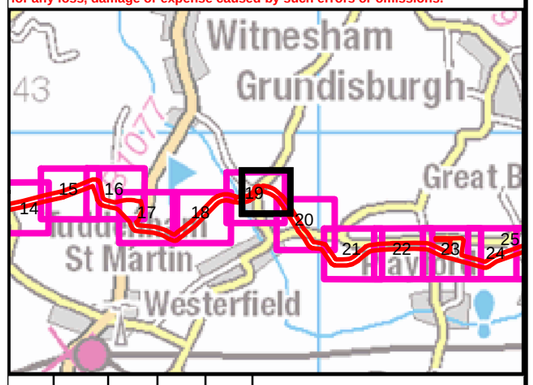

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0	29/07/16				FOR INFORMATION

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COORDINATE SYSTEM: BNG
DATUM: OSGB 1936
PROJECTION: TRANSVERSE MERCATOR
UNITS: METRE

PURPOSE: FOR INFORMATION

SCALE: 1:2,000 (0 – 50 – 100 m)
ORIGINAL PLOT SIZE: A3

PROJECT TITLE: EA ONE CABLE ROUTE

DRAWING TITLE: TUDDENHAM TRIAL PITS / BOREHOLES

DRAWING ID: 1 OF 1

DRAWING PREPARED BY: IBERDROLA Engineering & Construction

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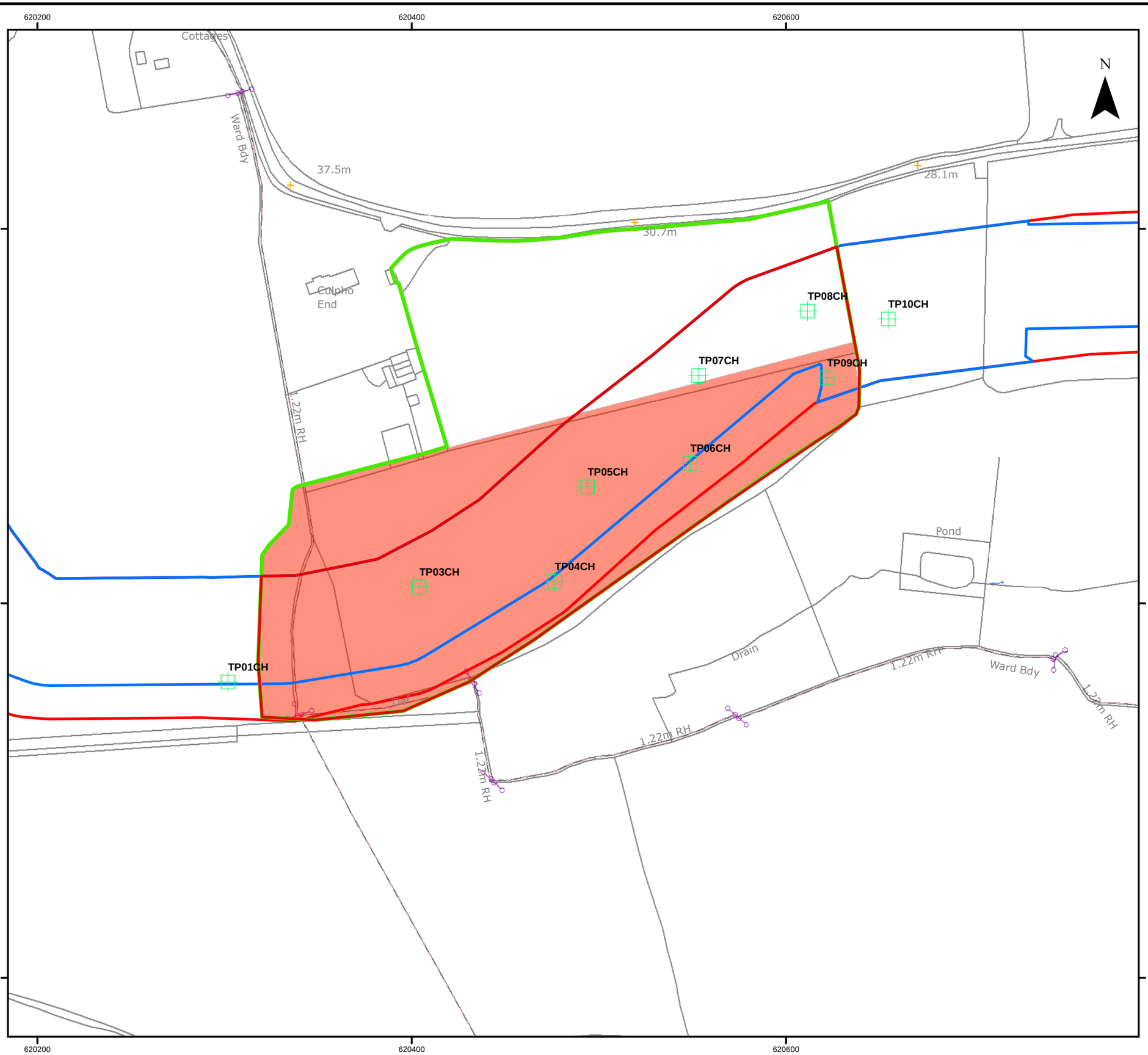

SCOTTISHPOWER RENEWABLES

LEGEND

- EA1 DCO Boundary
- Construction Corridor
- Culpho Trial Pits
- Investigation Area
- Potential Landfilling - Boundary uncertain
- Potentially Contaminated Land

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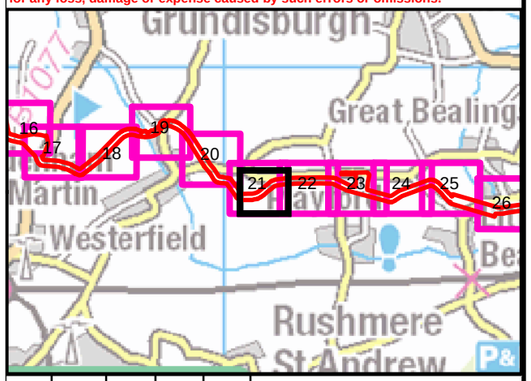

ISSUE	DATE	DRAWN	CHKD	APPD	REVISION NOTES
0	29/07/16				FOR INFORMATION

DRAWING NUMBER	EA1-GRD-DG-IEC-021870 Rev 0
COORDINATE SYSTEM / DATUM	BNG / OSGB 1936
PROJECTION / UNITS	TRANSVERSE MERCATOR / METRE
PURPOSE	FOR INFORMATION
SCALE	1:2,000 (0, 50, 100 m)
ORIGINAL PLOT SIZE	A3
PROJECT TITLE	EA ONE CABLE ROUTE
DRAWING TITLE	CULPHO TRIAL PITS
DRAWING ID	1 OF 1
DRAWING PREPARED BY:	IBERDROLA Engineering & Construction

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Appendix 3 REC Limited Factual Ground Investigation Reports

East Anglia ONE
Offshore Windfarm

East Anglia ONE Offshore Windfarm

Site Works Report – Tuddenham St Martin

ID: EA1-CON-R-IBR-1CO101165P1R2

Created by / date: Charlotte Toth / 22nd August 2016
Checked by / date: Marc Roberts / 22nd August 2016
Approved by / date: Stuart Phillips / 22nd August 2016

SCOTTISHPOWER RENEWABLES

REVISION CONTROL

Revision and Approvals					
Rev	**Date**	**Reason for Issue**	**Originated by**	**Checked by**	**Approved by**
0	27-06-2016	Draft for internal review	CT	IM/JD	
1	29-07-2016	Final issue	CT	M/JD	
2	22-08-2016	Final issue following client amendments	CT	IM/JD	

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Figures

Appendices

Abbreviations

AC – Alternating Current
BH - Borehole
CEC – Cation Exchange Capacity
CfD – Contract for Difference
DC – Direct Current
DCO – Development Consent Order
DECC – Department for Energy and Climate Change
EAOL – East Anglia One Limited
ES – Environmental Statement
EQS – Environmental Quality Standard
HVAC – High Voltage Alternating Current
HVDC – High Voltage Direct Current
LPA – Local Planning Authority
MW – Megawatts
PAHs – Polyaromatic Aromatic Hydrocarbons
SPR – ScottishPower Renewables
sVOCs – Semi Volatile Organic Compounds
TOC – Total Organic Carbon
TP – Trial Pit
WAC – Waste Acceptance Criteria

1 Introduction

1.1 Project Overview

1. Resource and Environmental Consultants (REC) Ltd has been commissioned by Iberdrola Engineering and Construction (IEC) herein referenced as "the Client" to undertake a ground investigation at "Tuddenham St Martin Landfill" herein referenced as "the Site" in order to discharge Planning Condition 17 for the proposed development which relates to Contaminated Land and Ground Water.

2. Instructions to proceed were detailed in the contract documents for the Site dated 13th April 2016. The following documents were issued to REC prior to commencement of works:

- East Anglia ONE Offshore Windfarm – Selected Geo-environmental Ground Investigation of Onshore Cable Route. Technical Specification (Ref: EA1-CON-I-IBR-001436 Rev0), dated November 2015;
- East Anglia ONE Offshore Windfarm – Phase 1 Desk Study Report by IEC (Ref No IEC-EHWF-1A8L-01-Rev0), dated August 2015;
- Indicative exploratory hole locations:
    - EA1-GRD-DG-IEC-007731_Proposed Exploratory Hole Location Plan Culpho Hall Landfill Rev 0B.pdf
    - EA1-GRD-DG-IEC-007732_Proposed Exploratory Hole Location Plan Tuddenham St Martin Landfill Rev 0A.pdf
    - EA1-GRD-DG-IEC-007733_Spring_Sampling_Tuddenham_Landfill Rev 0B.pdf

1.2 Purpose and Scope

3. The purpose of the Ground Investigation was to identify any areas of contaminated ground in relation to suspected landfill locations along a section of the 37km East Anglia ONE Onshore Cable Route, which forms part of the consented East Anglia One Offshore Windfarm (EAOW).

1.3 Duration of Investigation

4. Site work was carried out between 1st and 7th June 2016 2016 with subsequent land gas and groundwater monitoring visits to be undertaken in June and July 2016.

1.4 Limitations

5. The comments and opinions expressed in this report are based on the ground conditions encountered during the site work and the results of tests carried out in the field and in the laboratory. There may however, be special conditions prevailing on the Site which have not been disclosed by this investigation and which have not been taken into account by this report. The full limitations of this report are presented in Appendix 1.

1.5 Confidentiality

6. REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2 Site Investigation

2.1 Summary of Information Provided

1.1.1 Site Details

Site Address	Clopton Road, Tuddenham St Martin, Ipswich, Suffolk, IP6 9BY
National Grid Reference	TM 19334 49207
Site Area	3.0 Ha

2.1.1 Site Description and Topography

7. The historic landfill is situated to the north of the village of Tuddenham St Martin, with Clopton Road running along the western boundary. To the north, east and south of the landfill are agricultural fields. To the west, beyond Clopton Road, are a couple of widely spaced residential properties and gardens within otherwise open land.

8. The whole landfill area is roughly rectangular in shape and occupies approximately 3 hectares. The National Grid Reference (NGR) for the centre of the site is TM 19334 49207. The investigation area was within the northern half of the landfill. The topography is undulating, in places steep, with a potential fall in level of approximately10m from east to west.

9. The current use of the area is overgrown with vegetation of grasses, nettles and brambles, with building rubble, wire and plastic frequently noted to be present at surface.

2.1.2 Geology

10. The published geology indicates the solid geology underlying the landfill to comprise Chillesford Church Sand Member overlying Thames Group. The superficial deposits of the Lowestoft Formation is indicated to surround the site.

2.2 Scope

11. The scope of intrusive works was provided by the Client within the Technical Specification (Ref: EA1-CON-I-IBR-001436 Rev0) comprised the following:

- A topographic survey of the cable route through the landfill should be completed prior to the Phase 2 site investigation;
- 3 No. cable percussive boreholes to prove London Clay at anticipated depths of between 8m and 18m, depending on ground elevation at borehole location;
    - During cable percussive boring, environmental soil samples for potential analysis to be obtained within Made Ground deposits at half metre intervals for the top 2.5m and at metre intervals below;
    - Throughout the cable percussion boreholes, disturbed soil samples for material description to be obtained and insitu SPT tests to be performed, at metre intervals to 5.0m depth and 1.5 m intervals below;
    - Gas and groundwater monitoring standpipe to be installed in all cable percussion boreholes. Anticipated 50mm ID HDPE slotted pipe with geowrap and 10mm diameter pea gravel filter through response zone. Raised lockable cover required; and
    - Standpipe groundwater levels to be monitored daily during fieldwork. Post fieldwork groundwater and gas monitoring at fortnightly intervals for a period of 8 weeks initially. Standpipes are to be developed during the first post fieldwork monitoring visit and on the second visit groundwater samples are to be obtained for environmental laboratory testing.
- A minimum of 6 No. mechanically excavated trial pits/ trenches to depths of up to 2.5m;
    - During trial pitting, environmental soil samples for potential laboratory analysis to be obtained within Made Ground deposits at half metre intervals;
    - In situ PID testing to be undertaken on duplicate environmental samples;
    - Throughout trial pitting, representative disturbed soil samples for material description to be obtained; and
    - The limits of Made Ground deposits along the cable route corridor within the landfill are to be confirmed by trial trenching.
- On commencement of investigation, surface water quality sampling and laboratory analysis for six of Environment Agency monitoring points (Ref: FYN011, FYN013, FYN 014, FYN016, FYN018 and FYN020 at Tuddenham Bridge);

- Chemical laboratory analysis; and
- Factual Reporting.

3 Fieldwork

3.1 Summary of Fieldwork

12. The majority of surface water quality sampling was undertaken, prior to the ground investigation works, on the 12th May 2016. One sample was taken from River Fynn on the 6th June, during fieldwork. Laboratory analysis of these samples are shown in Appendix 3.

13. Ground investigation works were completed between the 1st and 7th June 2016 and are summarised in Table 3.1 below.

Table 3.1 Fieldwork Summary Table

Exploratory Hole Type	Exploratory Hole Reference	Depth (m bgl)	Further Detail
Machine Excavated Trial Pit	TP01-TM	2.5	**Rationale:** To determine the depth and composition of landfill material and establish the boundary of the landfill site.
	TP02-TM	2.5	
	TP03-TM	2.4	
	TP04-TM	2.3	
	TP05-TM	2.2	
	TP06-TM	2.0	
Cable Percussion Boreholes	BH01-TM	12.0	
	BH02-TM	18.5	
	BH03-TM	19.5	

3.2 Site Investigation Standards

14. All exploratory hole work, associated sampling, in-situ testing and logging was carried out in accordance with techniques outlined in BS EN ISO 14688-1, Identification of soil, BS EN ISO 14688-2 classification of soil, BS EN ISO 22475, Sampling methods and groundwater measurements and BS EN ISO 22476 – Field Testing, as appropriate, at positions as near as practicable to those supplied by the client. These are shown on the exploratory hole location plan 1CO101165P1R0-002.

15. The depths of all exploratory holes, descriptions of the materials encountered and details of sampling are presented in Appendix 2.

3.3 Deviations from the Original Scope of Works

16. Deviations from the original scope of works, as provided by the Client, are presented in Table 3.2 below.

Table 3.2 Deviations from the Original Scope of Works

Exploratory Hole Location	Details
Water sampling	Water sampling as undertaken prior to commencement rather than upon commencement as requested by the client.
All exploratory holes	Topographical survey was not required as it had been previously undertaken. X, Y and Z co-ordinates required as per the original specification provided by the Client.

4 Laboratory Analysis

4.1 Chemical Laboratory Analysis

17. Chemical laboratory testing, scheduled by IEC's engineer, was carried out on samples taken from various strata by Scientific Analytical Laboratories (SAL) in Braintree. SAL are UKAS accredited for a wide range of chemical tests. Full laboratory results are located within Appendix 3.

18. Details of the specific tests scheduled by IEC are presented in the tables below:

Table 4.1 Summary of Chemical Laboratory Analysis – Suite E

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Arsenic	2 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
Boron	1 mg/kg	ICP/OES (SIM)	-	34
Cadmium	0.1 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
Chromium (total)	0.5 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
Lead	2 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
Mercury	1 mg/kg	ICP/OES (Aqua Regia Extraction)	UKAS	34
Nickel	0.5 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
Zinc	2 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
pH	-	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	34
Water soluble sulphate (as SO4)	0.01 g/l	2:1 Extraction/ICP/OES (TRL 447 T1)	MCERTS	34
Organic matter	0.1 %	Calc TOC/0.58	-	34
Total petroleum hydrocarbons	10 mg/kg	GC/FID (SE)	MCERTS	34
Speciated polyaromatic hydrocarbons (USEPA 16)	0.1 mg/kg	GC/MS	MCERTS/UKAS	34
Phenol	1 mg/kg	Colorimetry (CF)	MCERTS	34
Cyanide (total)	1 mg/kg	Colorimetry (CF)	MCERTS	34
Asbestos Bulk ID	-	PLM	UKAS	34
TPH CWG with BTEX (C6 to C35)	0.1-2mg/kg	GC/FID (SE) / GC/MS (Headspace)	-	34
Cyanide (free)	1 mg/kg	Colorimetry (CF)	MCERTS	34
Selenium	3 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	UKAS	34
Vanadium	0.1 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	UKAS	34
Chloride	2 mg/kg	Discrete Analyser	-	34

Table 4.2Summary of Chemical Laboratory Analysis – Suite F

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Arsenic	0.2 µg/l	ICP/MS (Filtered)	UKAS	18
Boron	0.05 mg/l	ICP/MS (Filtered)	UKAS	18
Cadmium	0.02 µg/l	ICP/MS (Filtered)	UKAS	18
Chromium (total)	1 µg/l	ICP/MS (Filtered)	UKAS	18
Lead	0.3 µg/l	ICP/MS (Filtered)	UKAS	18
Mercury	0.05 µg/l	ICP/MS (Filtered)	UKAS	18
Nickel	1 µg/l	ICP/MS (Filtered)	UKAS	18
Zinc	2 µg/l	ICP/MS (Filtered)	UKAS	18
pH	-	Probe	UKAS	18
Water soluble sulphate (as SO4)	0.5 mg/l	Discrete Analyser	UKAS	18
Total petroleum hydrocarbons	20 µg/l	GC/FID (SE)	-	18
Speciated polyaromatic hydrocarbons (USEPA 16)	0.01 µg/l	GC/MS (SIR)	-	18
Phenol	0.02 mg/l	Colorimetry (CF)	UKAS	18
Cyanide (total)	0.01 mg/l	Colorimetry (CF)	UKAS	18
Ammoniacal nitrogen	0.05 mg/l	Discrete Analyser	UKAS	18
Total Hardness expressed as CaCO3	10 mg/l	ICP/OES (Calc)	UKAS	18
Nitrate	0.5 mg/l	Discrete Analyser	UKAS	18
Nitrite	0.1 mg/l	Discrete Analyser	UKAS	18
Chloride	1 mg/l	Discrete Analyser	UKAS	18
BOD	1 mg/l	Probe (Incubation Carbonaceous) (5 Days)	-	18
COD	20 mg/l	Colorimetry (CE)	-	18

Table 4.3 Summary of Chemical Laboratory Analysis – Suite H Waste Classification Testing

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Soil analysis				5
Total organic carbon	0.1 %	OX/IR	-	5
BTEX	10 µg/l	GC/MS (Headspace)	MCERTS	5
PCBs (7 congeners)	20 µg/l	GC/MS	MCERTS	5
Mineral oil (C 10 -C 40)	10 mg/kg	GC/FID (SE)	-	5
PAHs	0.1 mg/kg	GC/MS	MCERTS	5
Loss on ignition	0.1 %	Ign 450C/Grav	MCERTS	5
pH	-	Probe	MCERTS	5
Leachate analyses				5
Arsenic	0.2 µg/l	ICP/MS (Filtered)	UKAS	5

Barium	1 µg/l	ICP/MS (Filtered)	UKAS	5
Cadmium	0.02 µg/l	ICP/MS (Filtered)	UKAS	5
Chromium (total)	1 µg/l	ICP/MS (Filtered)	UKAS	5
Copper	0.5 µg/l	ICP/MS (Filtered)	UKAS	5
Mercury	0.05 µg/l	ICP/MS (Filtered)	UKAS	5
Molybdenum	1 µg/l	ICP/MS (Filtered)	UKAS	5
Nickel	1 µg/l	ICP/MS (Filtered)	UKAS	5
Lead	0.3 µg/l	ICP/MS (Filtered)	UKAS	5
Antimony	1 µg/l	ICP/MS (Filtered)	UKAS	5
Selenium	0.5 µg/l	ICP/MS (Filtered)	UKAS	5
Zinc	2 µg/l	ICP/MS (Filtered)	UKAS	5
Chloride	1 mg/kg	Discrete Analyser	UKAS	5
Fluoride	0.05 mg/l	Discrete Analyser	UKAS	5
Sulphate (as SO4)	0.5 mg/l	Discrete Analyser	UKAS	5
Total dissolved solids	1 mg/l	Calc (by EC)	-	5
Phenol index	0.02 mg/l	Discrete Analyser	UKAS	5
Dissolved organic carbon at own pH or pH 7.5-8.0	1 mg/l	OX/IR	UKAS	5

Table 4.4Summary of Chemical Laboratory Analysis – Additional Testing

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Ammonia	0.5 mg/kg	Colorimetry	-	34
VOCs	5-50 µg/kg	GC/MS (Headspace)	MCERTS/UKAS	19

Table 4.5 Supplementary Asbestos Quantification

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Asbestos Quantification Stage 3	0.001 %	PLM/Grav	-	4

5 Site Observations

5.1 Ground Conditions Observed

19. The ground investigation generally confirmed the published geology detailed in Section 2.1.3 and identified the strata set out below:

5.1.1 Made Ground

20. Made Ground was encountered in all of the exploratory hole locations at varying depths and composition. All locations were covered by overgrown vegetation of grasses, nettles and brambles.

21. To the west of the site, the Made Ground was thinner with maximum depths of 1.6m bgl (BH01). This comprised dark brown clayey silty SAND with frequent rootlets and fragments of metal, barbed wire, plastic and brick. Localised areas contained fragments of concrete, asphalt, and glass bottles.

22. To the centre and east of the site, on the higher ground, greater depths of Made Ground was encountered. In TP06, the western-most location, the base of the Made Ground was encountered to a depth of 0.8m bgl. However, Made Ground was proven to extend to depths of 9.5-10.0m bgl within BH03 and BH02 respectively. Generally, the Made Ground to the centre and east of the site comprised brown/grey slightly clayey, gravelly SAND with frequent fragments of flint, concrete, brick, plastic, metal and wood. Localised areas contained occasional fragments of glass pottery and clinker.

5.1.2 Chillesford Sand Member

23. To the west of the site, the Chillesford Church Sand Member was encountered at shallow depths of 0.50 to 1.60m bgl, however to the centre and east of the site this stratum was not encountered until 9.5 to 10.0m bgl due to the infilling of the Made Ground. This stratum typically comprised medium dense light brown SAND, occasionally slightly gravelly and slightly silty.

5.1.3 Thames Group

24. The Thames Group was encountered within the deeper borehole locations at a minimum depth of 9.75m bgl to a maximum, unproven, depth of 19.50m bgl. Typically the Thames Group was stiff to very stiff dark to blueish grey CLAY, though grey angular to rounded fine to coarse mudstone GRAVEL was encountered within BH03 between 17.0 and 17.5m bgl.

5.2 Lowestoft Formation

25. The Lowestoft Formation was encountered within TP05-TM and TP06-TM in the east of the site only, at depths ranging from 0.80 and 1.90m bgl. This stratum consisted of grey mottled white slightly sandy gravelly CLAY. The gravel component comprised angular to rounded, fine to coarse flint and chalk. The clay was observed to be becoming increasingly friable with depth.

5.3 Groundwater

26. The comments on groundwater conditions are based on the observations made at the time of the investigation. It should be noted that groundwater levels vary owing to seasonal and other effects.

27. Groundwater was not encountered within any of the trial pits, however all boreholes encountered groundwater during the site works operation. Details are given in the relevant exploratory hole log.

28. Following the installation of the monitoring installations, groundwater was monitored as detailed in the table below:

Table 5.1 Summary of Groundwater Monitoring During Site Works

Location	Date	Depth to water (m bgl)	Depth to base (m bgl)
BH02-TM	06/06/16	12.7	-
	07/06/16	12.1	16.1

BH03-TM	06/06/16	13.1	-
	07/06/16	13.9	16.4

Key: m bgl – metres below ground level. / BH01-TM not monitored as site works completed on same day.

5.4 Standard Penetration Testing

29. Standard Penetration Tests (SPT) were carried out in the cable percussive boreholes in accordance with techniques outlined in BS EN ISO 22476 – Field Testing, in order to assess the strength/density of the underlying materials. The 'N' value (number of blows per 300mm penetration) or the blow count/penetration was recorded for each test.

30. The results of the Standard Penetration Testing are included on the Exploratory Hole Logs (Appendix 2) and summarised in Table 5.2 below:

Table 5.2 Summary of SPT results

Location	Depth (m bgl)	Stratum	CPT/SPT "N" Value
BH01-TM	1.2	Chillesford Church Sand Member	4
	2.0		6
	3.0		5
	4.0		6
	5.0		17
	6.5		19
	8.0		18
	9.5		20
	11.0	Thames Group	26
BH02-TM	1.2	Made Ground	13
	2.0		20
	3.0		10
	4.0		7
	5.0		10
	6.5		12
	8.0		13
	9.5		15
	11.0	Chillesford Church Sand Member	20
	12.5		21
	14.0		23
	15.5		24
	17.0	Thames Group	26
	18.5		30
BH03-TM	1.2	Made Ground	1
	2.0		3
	3.0		7

	4.0		7
	5.0		7
	6.5		12
	8.0		8
	9.5	Chillesford Church Sand Member	14
	11.0		18
	12.5		36
	14.0		24
	15.5		28
	17.0	Thames Group	9
	18.5		19

Key: m bgl – metres below ground level.

5.5 Gas Monitoring

Table 5.3 Results of Gas Monitoring

Date	Well	Flow (l/hr)		Low O_2 %v/v	Concentration CH_4		CH_4 Qhg l/hr	Concentration CO_2		CO_2 Qhg l/hr	Atmospheric Dynamic	Response Zone (m bgl)	Depth to Water (m bgl)	Response Zone flooded?
		Peak	Steady		Peak %v/v	Steady %v/v		Peak %v/v	Steady %v/v					
14/06/16	BH01	0.1	0.1	11.5	<0.1	<0.1	<0.0001	8.2	8.2	0.0082	995 - falling	1.0-9.75	6.15	No
	BH02	<0.1	<0.1	1.0	0.3	<0.1	<0.0003	16.1	12.5	<0.0161	993 - falling	1.0-16.0	12.66	No
	BH03	0.1	0.1	7.3	<0.1	<0.1	<0.0001	14.0	13.7	0.0140	992 - falling	1.0-15.91	13.15	No
30/06/16	BH01	<0.1	<0.1	14.4	<0.1	<0.1	<0.0001	9.0	8.4	<0.0090	1007 - steady	1.0-9.72	6.13	No
	BH02	<0.1	<0.1	20.6	<0.1	<0.1	<0.0001	0.4	0.1	<0.0004	1007 - steady	1.0-15.82	12.65	No
	BH03	0.1	0.1	9.3	<0.1	<0.1	<0.0001	11.7	11.7	0.0117	1007 - steady	1.0-16.26	13.16	No
12/07/16	BH01	<0.1	<0.1	14.5	<0.1	<0.1	<0.0001	8.2	8.2	0.0082	1015 - rising	1.0-9.72	6.20	No
	BH02	<0.1	<0.1	20.7	<0.1	<0.1	<0.0001	0.4	0.4	0.0004	1015 - rising	1.0-15.77	12.69	No
	BH03	<0.1	<0.1	20.8	<0.1	<0.1	<0.0001	0.5	0.5	0.0005	1015 - rising	1.0-16.19	13.20	No
26/07/16	BH01	<0.1	<0.1	11.3	<0.1	<0.1	<0.0001	11.2	10.8	0.0112	1021 - falling	1.0-9.70	6.22	No
	BH02	<0.1	<0.1	20.8	<0.1	<0.1	<0.0001	0.1	0.1	0.0001	1021 - falling	1.0-15.78	12.69	No
	BH03	<0.1	<0.1	20.0	<0.1	<0.1	<0.0001	1.2	1.2	0.0012	1021 - falling	1.0-16.14	13.21	No

Figure 1 Site Location Plans

619200 619400 619600

249400 249200 249000

N

31.8m
37.0m
34.0m
34.4m
30.7m
36.1m
36.6m
LANE
Track
Pond
Bungalow
Gipsy
Drain
1.22m Rh
Pond
Finnlands
Carswood

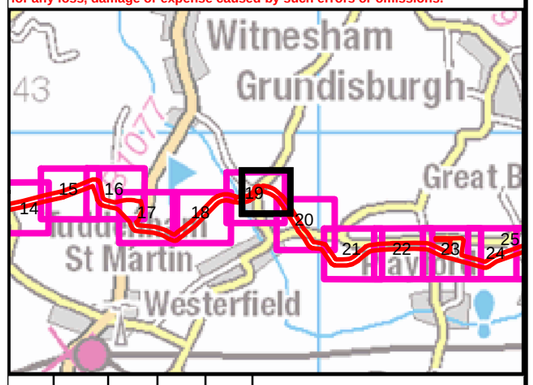
TP01TM
TP02TM
TP03TM
TP04TM
TP05TM
TP06TM
BH01TM
BH02TM
BH03TM

SCOTTISHPOWER RENEWABLES

LEGEND

- EA1 DCO Boundary
- Construction Corridor
- Tuddenham Trial Pits / Boreholes
- Assumed Extent of Landfill Areas

Note:
This map has been produced to the latest known information at the time of issue, and has been produced for your information only.Please consult with the SPR GIS team to ensure the content is still current before using the information contained on this map.
To the fullest extent permitted by law, we accept no responsibility or liability (whether in contract, tort (including negligence) or otherwise in respect of any errors or omissions in the information contained in the map and shall not be liable for any loss, damage or expense caused by such errors or omissions.



ISSUE	DATE	DRAWN	CHKD	APPD	REVISION NOTES
1	05/08/16				FOR INFORMATION
0	29/07/16				FOR INFORMATION

DRAWING NUMBER: EA1-GRD-DG-IEC-021871 Rev 1

COORDINATE SYSTEM: BNG
DATUM: OSGB 1936
PROJECTION: TRANSVERSE MERCATOR
UNITS: METRE

PURPOSE: FOR INFORMATION

SCALE: 1:2,000 (0 – 50 – 100 m)
ORIGINAL PLOT SIZE: A3

PROJECT TITLE: EA ONE CABLE ROUTE

DRAWING TITLE: TUDDENHAM TRIAL PITS / BOREHOLES

DRAWING ID: 1 OF 1

DRAWING PREPARED BY: IBERDROLA Engineering & Construction

pw:\\FGDPRODPWV8.euro.iberdrola.local:UKRENEW\Documents\UK%20Offshore\3%20-%20PROJECTS\EA1%20Grid%20Package\03%20ONSHORE%20CABLE\02%20ENGINEERING%20DESIGN\01%20Technical%20Documentation\07%20GIS\01%20Drawings\

Appendix 1 Limitations

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Ltd and the Client as indicated in Section 1.2.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. In addition to the above REC Ltd note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.

7. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

8. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

9. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

10. This report presents an interpretation of the geotechnical information established by excavation, observation and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that man made deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently there may be conditions present not revealed by this investigation.

11. REC can not be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.

12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

Appendix 2 Exploratory Hole Logs

Borehole Log

Borehole No. **BH01 - TM**

Sheet 1 of 2

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619299.05 Northing: 249287.75	Hole Type: BH
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: Dando Cable Percussive Rig	Level (m AOD): 32.16 Final Depth (m): 12.00	Scale: 1:50
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Borehole Solutions Ltd	Start Date: 07/06/2016 End Date: 07/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
						32.16		Overgrown vegetation over very loose dark brown slightly clayey, silty SAND with frequent cobbles of brick and metal. Frequent rootlets. Sand is fine to coarse. [MADE GROUND]
		0.50	D		0.50	31.66		
		0.50	ES					
		1.00	D					Loose to medium dense light brown slightly gravelly, silty SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint. [CHILLESFORD CHURCH SAND MEMBER]
		1.00	ES					
		1.20	D					
		1.20	SPT	N=4 (0,1/1,1,1,1)				
		1.50	D					
		1.50	ES					
		2.00	D					
		2.00	ES					
		2.00	SPT	N=6 (0,2/2,1,1,2)				
		2.50	D					
		2.50	ES					
		3.00	D					
		3.00	SPT	N=5 (0,3/1,1,2,1)				
		3.50	D					
		4.00	D					
		4.00	SPT	N=6 (0,5/1,2,1,2)				
		4.50	D					
		5.00	D					
		5.00	SPT	N=17 (0,5/3,4,5,5)				
		6.00	D					
		6.50	D					
		6.50	SPT	N=19 (0,4/3,4,6,6)				
	▼	7.00	D					
		8.00	D					
		8.00	SPT	N=18 (0,4/3,4,5,6)				
		9.00	D					
		9.50	D		9.10	23.06		Medium dense grey sandy GRAVEL. Sand is coarse. Gravel is angular to rounded, fine to coarse mudstone. [THAMES GROUP]
		9.50	SPT	N=20 (0,14/5,4,5,6)				
		9.70	D		9.75	22.41		Stiff dark grey CLAY.
		10.00	D					

Continued on Next Sheet

Remarks:

Location cleared for services using a Cable Avoidance Tool. Service inspection pit hand excavated to 1.20mbgl. Groundwater encountered at 7.00mbgl . 50mm standpipe installed to 10.00mbgl.

Borehole Log

Borehole No. **BH01 - TM**

Sheet 2 of 2

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619299.05 Northing: 249287.75	Hole Type: BH
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: Dando Cable Percussive Rig	Level (m AOD): 32.16 Final Depth (m): 12.00	Scale: 1:50
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Borehole Solutions Ltd	Start Date: 07/06/2016 End Date: 07/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		11.00 11.00	D SPT	N=26 (0,8/5,6,7,8)				[THAMES GROUP]
					12.00			End of Borehole at 12.00m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Service inspection pit hand excavated to 1.20mbgl. Groundwater encountered at 7.00mbgl . 50mm standpipe installed to 10.00mbgl.

Borehole Log

Borehole No. **BH02 - TM**

Sheet 1 of 2

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619335.78 Northing: 249282.38	Hole Type: BH
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: Dando Cable Percussive Rig	Level (m AOD): 38.67 Final Depth (m): 18.50	Scale: 1:50
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Borehole Solutions Ltd	Start Date: 03/06/2016 End Date: 06/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.50	D			38.67		Overgrown vegetation over loose to medium dense dark grey slightly clayey, gravelly, fine to coarse SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint, brick, concrete and clinker. Frequent metallic objects, plastic, and glass fragments present. [MADE GROUND]
		0.50	ES					
		0.50	ES1					
		1.00	D					
		1.00	ES					
		1.00	ES2					
		1.20	D					
		1.20	SPT	N=13 (0,2/2,2,3,6)				
		1.50	D					
		1.50	ES					
		1.50	ES3					
		2.00	D					
		2.00	ES					
		2.00	ES4					
		2.00	SPT	N=20 (0,6/4,6,8,2)				
		2.50	D					
		2.50	ES					
		2.50	ES5					
		3.00	D					
		3.00	SPT	N=10 (0,3/1,2,3,4)				
		3.50	D		3.50	35.17		Loose to medium dense dark blueish grey slightly clayey, gravelly, fine to coarse SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint, brick, concrete and clinker. Frequent metallic objects, plastic, and glass fragments present. Frequent tarpaulin sheets present. [MADE GROUND]
		4.00	D					
		4.00	SPT	N=7 (0,2/1,2,2,2)				
		4.50	D					
		5.00	D					
		5.00	SPT	N=10 (0,3/4,3,2,1)				
		6.00	D					
		6.50	D					
		6.50	SPT	N=12 (0,4/3,4,2,3)				
		7.00	D					
		8.00	D		7.70	30.97		Medium dense greyish brown silty, fine to coarse SAND. Sand is fine to coarse. Frequent plastic fragments. [MADE GROUND]
		8.00	SPT	N=13 (0,4/3,3,4,3)				
		9.00	D					
		9.50	D					
		9.50	SPT	N=15 (0,5/3,4,4,4)				
		10.00	D		10.00	28.67		

Continued on Next Sheet

Remarks:

Location cleared for services using a Cable Avoidance Tool. Service inspection pit hand excavated to 1.20mbgl. Groundwater encountered at 14.50mbgl. 50mm diameter standpipe installed to 16.50mbgl.

Borehole Log

Borehole No. **BH02 - TM**

Sheet 2 of 2

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619335.78 Northing: 249282.38	Hole Type: BH
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: Dando Cable Percussive Rig	Level (m AOD): 38.67 Final Depth (m): 18.50	Scale: 1:50
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Borehole Solutions Ltd	Start Date: 03/06/2016 End Date: 06/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		11.00 11.00	D SPT	N=20 (0,7/4,5,5,6)				Medium dense light brown fine to coarse SAND. Sand is fine to coarse. [CHILLESFORD CHURCH SAND MEMBER]
		12.00	D					
		12.50 12.50	D SPT	N=21 (0,6/4,5,6,6)				
		13.00	D					
		13.50	D					
		14.00 14.00	D SPT	N=23 (0,7/5,5,6,7)				
	▼							
		15.00	D					
		15.50 15.50	D SPT	N=24 (0,8/5,6,6,7)				
		16.00	D					
		16.50	D		16.50	22.17		Very stiff blueish grey CLAY. [THAMES GROUP]
		17.00 17.00	D SPT	N=26 (0,9/5,6,7,8)				
		18.00	D					
		18.50 18.50	D SPT	N=30 (0,9/7,7,8,8)	18.50			End of Borehole at 18.50m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Service inspection pit hand excavated to 1.20mbgl. Groundwater encountered at 14.50mbgl. 50mm diameter standpipe installed to 16.50mbgl.

Borehole Log

Borehole No. **BH03 - TM**

Sheet 1 of 2

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619373.33 Northing: 249270.39	Hole Type: BH
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: Dando Cable Percussive Rig	Level (m AOD): 39.16 Final Depth (m): 19.50	Scale: 1:50
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Borehole Solutions Ltd	Start Date: 01/06/2016 End Date: 03/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
						39.16		
					0.20	38.96		Overgrown vegetation over soft dark brown slightly sandy, gravelly CLAY with frequent rootlets. Gravel is angular to rounded, fine to coarse flint and concrete. [MADE GROUND]
		0.50	D					Very loose to loose light brown slightly silty, gravelly SAND. Sand is fine to coarse. Gravel is rounded to angular, fine to coarse concrete and brick. Occasional fragments of pottery, glass and plastic. Occasional cobbles of concrete. [MADE GROUND]
		0.50	ES					
		1.00	D					
		1.00	ES					
		1.10	D					
		1.20	SPT	N=1 (0,1/0,0,1,0)				
		1.50	D					
		1.50	ES					
		2.00	D					
		2.00	ES					
		2.00	SPT	N=3 (0,2/1,0,1,1)				
		2.50	D					
		2.50	ES					
		3.00	D					
		3.00	SPT	N=7 (0,5/1,1,2,3)				
		3.50	D		3.50	35.66		Soft black slightly sandy, ashy, gravelly CLAY. Sand is fine to coarse. Gravel is rounded to angular, fine to coarse brick, concrete and flint. Occasional fragments of metal and wood. [MADE GROUND]
		4.00	D					
		4.00	SPT	N=7 (0,3/1,1,2,3)				
		4.50	D					
		5.00	D					
		5.00	SPT	N=7 (0,5/3,1,1,2)				
		6.00	D					
		6.50	D		6.50	32.66		Firm to stiff reddish brown slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse brick and concrete, with occasional glass fragments. [MADE GROUND]
		6.50	SPT	N=12 (0,6/4,2,3,3)				
		7.00	D					
		8.00	D					
		8.00	SPT	N=8 (0,5/2,1,2,3)				
		9.00	D					
		9.50	D		9.50	29.66		Medium dense yellowish brown SAND. Sand is fine to coarse. [CHILLESFORD CHURCH SAND MEMBER]
		9.50	SPT	N=14 (0,4/3,3,4,4)				
		10.00	D					

Continued on Next Sheet

Remarks:

Location cleared for services using a Cable Avoidance Tool. Service inspection pit hand excavated to 1.20mbgl. Groundwater strike at 15.50mbgl. 50mm diameter standpipe installed to 18.50mbgl.

Borehole Log

Borehole No. **BH03 - TM**

Sheet 2 of 2

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619373.33 Northing: 249270.39	Hole Type: BH
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: Dando Cable Percussive Rig	Level (m AOD): 39.16 Final Depth (m): 19.50	Scale: 1:50
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Borehole Solutions Ltd	Start Date: 01/06/2016 End Date: 03/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		11.00 11.00	D SPT	N=18 (0,6/4,4,5,5)				
		12.00	D					
		12.50 12.50	D SPT	N=36 (0,7/6,8,10,12)	12.50	26.66		Medium dense to dense orangeish brown SAND. Sand is fine to coarse. [CHILLESFORD CHURCH SAND MEMBER]
		13.00	D					
		14.00 14.00	D SPT	N=24 (0,8/5,6,6,7)				
		14.50	D					
		15.00	D					
	▼	15.50 15.50	D SPT	N=28 (0,9/6,6,7,9)				
		16.00	D					
		17.00 17.00	D SPT	N=9 (0,8/2,2,2,3)	17.00	22.16		Loose grey angular to rounded fine to coarse mudstone GRAVEL. [THAMES GROUP]
					17.50	21.66		Stiff blueish grey CLAY. [THAMES GROUP]
		18.00	D					
		18.50 18.50	D SPT	N=19 (0,6/4,4,5,6)				
					19.50			End of Borehole at 19.50m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Service inspection pit hand excavated to 1.20mbgl. Groundwater strike at 15.50mbgl. 50mm diameter standpipe installed to 18.50mbgl.

Trial Pit Log

Borehole No. **TP01 - TM**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619298.29 Northing: 249267.45	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: JCB 3CX	Level (m AOD): 32.50 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 06/06/2016 End Date: 06/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						32.49		Dark brown slightly clayey, silty SAND. Sand is fine to coarse. Frequent boulders of concrete, asphalt, metal, barbed wire, glass bottles, plastic. Small fragments of all of above and chalk. [MADE GROUND]
		0.50 0.50	ES PID	PID=0				
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0	1.60	30.90		
		2.00 2.00	ES PID	PID=0				Light brown slightly clayey, silty, slightly gravelly SAND. Sand is fine to coarse. Gravels are rounded, fine to coarse flints. [CHILLESFORD CHURCH SAND MEMBER]
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Side collapse

Pit Dimensions (m)

Length:	2.30
Width:	0.60
Depth:	2.50

Trial Pit Log

Borehole No.
TP02 - TM
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619301.53 Northing: 249321.52	Hole Type TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: JCB 3CX	Level (m AOD): 31.17 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 06/06/2016 End Date: 06/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						31.17		Dark brown clayey, slightly silty SAND. Sand is fine to coarse. Frequent large fragments of wire, plastic, metal and brick. Frequent rootlets and plastic bags. [MADE GROUND]
		0.50 0.50	ES PID	PID=0	0.50	30.67		Light brown slightly gravelly, silty SAND. Sand is fine to coarse. Gravel is rounded to sub-rounded, fine to coarse flint. [CHILLESFORD CHURCH SAND MEMBER]
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

1
2
3
4
5

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)

Length:	3.40
Width:	0.60
Depth:	2.50

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Trial Pit Log

Borehole No.
TP03 - TM
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619345.15 Northing: 249305.80	Hole Type TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: JCB 3CX	Level (m AOD): 38.14 Final Depth (m): 2.40	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 01/06/2016 End Date: 01/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						38.14		Overgrown vegetation over brown gravelly fine to coarse SAND. Sand is fine to coarse. Gravel is angular to round, fine to coarse brick, concrete, slate, plastic and glass. Medium cobble content. Cobbles are sub-round concrete and whole brick. [MADE GROUND]
		0.50 0.50	ES PID	PID=0				
		1.00 1.00	ES PID	PID=0				
								… between 1.20mbgl and 1.50mbgl: layer of slightly gravelly CLAY. Gravel is angular to round flint and chalk.
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
					2.40			End of Borehole at 2.40m

1
2
3
4
5

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)

Length:	2.20
Width:	0.80
Depth:	2.40

Trial Pit Log

Borehole No. **TP04 - TM**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619380.60 Northing: 249289.92	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: JCB 3CX	Level (m AOD): 39.95 Final Depth (m): 2.30	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 01/06/2016 End Date: 01/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 0.50	ES PID	PID=0		39.95		Overgrown vegetation over brown clayey, gravelly, fine to coarse SAND with medium cobble content. Sand is fine to coarse. Cobbles are angular to rounded flint, concrete and whole brick. Boulders are sub-rounded concrete. Frequent plastic, wood, glass and metallic objects present throughout. Gravel is angular-rounded fine to coarse flint, brick, concrete, gravel, wood and glass. [MADE GROUND]
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
					2.30			End of Borehole at 2.30m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)

Length:	2.10
Width:	0.80
Depth:	2.30

Trial Pit Log

Borehole No.
TP05 - TM
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619339.61 Northing: 249244.00	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: JCB 3CX	Level (m AOD): 39.36 Final Depth (m): 2.20	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 01/06/2016 End Date: 01/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.50 0.50	ES PID	PID=0		39.36		Overgrown vegetation over greyish brown gravelly fine to coarse SAND with medium cobble content. Sand is fine to coarse. Cobbles are angular to round whole brick and concrete. Metallic objects, plastic and wood fragments present. Gravel is angular to rounded concrete, brick and clinker. [MADE GROUND]
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0	1.90	37.46		Soft brown slightly gravelly, sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint and chalk. [LOWESTOFT FORMATION]
					2.20			End of Borehole at 2.20m

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Pit sides mostly stable but some collapse on southern side.

Pit Dimensions (m)
Length: 2.70
Width: 0.80
Depth: 2.20

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Trial Pit Log

Borehole No. **TP06 - TM**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 619384.44 Northing: 249235.52	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: JCB 3CX	Level (m AOD): 40.25 Final Depth (m): 2.00	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 01/06/2016 End Date: 01/06/2016	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						40.25		Overgrown vegetation over dark grey gravelly SILT. Gravel is angular to rounded concrete and brick. [MADE GROUND]
					0.30	39.95		Light brownish, white sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is angular to rounded concrete and brick. Cobbles are half brick and concrete. [MADE GROUND]
		0.50 0.50	ES PID	PID=0				
					0.80	39.45		Grey mottled white gravelly CLAY. Gravel is angular to rounded, fine to coarse flint and chalk. Clay is becoming increasingly friable with depth. [LOWESTOFT FORMATION]
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0	2.00			End of Borehole at 2.00m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)

Length:	1.70
Width:	0.80
Depth:	2.00

Appendix 3 Laboratory Certificates

SCIENTIFIC ANALYSIS LABORATORIES
DELIVERING SCIENCE

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: 580220-4

Date of Report: 13-Jul-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001221
Customer Site Reference: Iberdrola
Date Job Received at SAL: 07-Jun-2016
Date Analysis Started: 28-Jun-2016
Date Analysis Completed: 13-Jul-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Claire Brown Crociquia
Customer Service Manager

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

				SAL Reference	**580220 001**	**580220 002**	**580220 005**	**580220 006**	**580220 007**
				Customer Sample Reference	**BH1 D1 @ 0.50m**	**BH1 D14 @ 7.00m**	**BH2 D9 @ 4.00m**	**BH2 D12 @ 6.00m**	**BH2 D16 @ 9.00m**
				Date Sampled	**07-JUN-2016**	**07-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**11**	**9**	**68**	**37**	**10**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	**2**	**2**	**1**
Cadmium	T257	A40	0.1	mg/kg	<0.1	**0.2**	**4.2**	**3.4**	**0.2**
Chromium	T257	A40	0.5	mg/kg	**11**	**14**	**140**	**110**	**18**
Copper	T257	A40	2	mg/kg	**4**	**17**	**730**	**960**	**24**
Lead	T257	A40	2	mg/kg	**9**	**83**	**360**	**430**	**22**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	**1.4**	**1.7**	<1.0
Nickel	T257	A40	0.5	mg/kg	**12**	**15**	**150**	**110**	**14**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**29**	**26**	**140**	**93**	**25**
Zinc	T257	A40	2	mg/kg	**28**	**47**	**1400**	**960**	**52**
Chloride	T686	A40	2	mg/kg	**12**	**5**	**120**	**280**	**31**
pH	T7	A40			**8.3**	**7.9**	**7.1**	**7.2**	**7.3**
Soil Organic Matter	T287	A40	0.1	%	<0.1	**0.9**	**4.5**	**4.6**	**0.4**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	<0.01	**0.03**	**1.8**	**4.4**	**0.64**
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	<0.5	**0.9**	**580**	<0.5	**440**
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	**4**	**7**	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	**340**	**2000**	**310**
Moisture @105C	T162	AR	0.1	%	**14**	**13**	**18**	**18**	**9.7**
Retained on 2mm	T2	A40	0.1	%	**1.5**	<0.1	**16.4**	**11.9**	**2.9**

SAL Reference: 580220
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Soil Analysed as Soil
Suite E

				SAL Reference	**580220 008**	**580220 009**	**580220 012**	**580220 013**	**580220 014**
				Customer Sample Reference	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Other**	**Clay**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**2**	**39**	**48**	**26**	**16**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	<0.1	**0.2**	**3.4**	**26**	**0.8**
Chromium	T257	A40	0.5	mg/kg	**3.8**	**19**	**61**	**37**	**45**
Copper	T257	A40	2	mg/kg	**3**	**6**	**1000**	**260**	**390**
Lead	T257	A40	2	mg/kg	**3**	**17**	**980**	**770**	**200**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	**1.7**	**1.4**	<1.0
Nickel	T257	A40	0.5	mg/kg	**2.3**	**13**	**120**	**39**	**23**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**8.7**	**67**	**47**	**51**	**22**
Zinc	T257	A40	2	mg/kg	**15**	**37**	**920**	**880**	**250**
Chloride	T686	A40	2	mg/kg	**20**	**38**	**58**	**18**	**30**
pH	T7	A40			**8.6**	**7.9**	**7.5**	**7.3**	**6.9**
Soil Organic Matter	T287	A40	0.1	%	<0.1	<0.1	**12**	**4.5**	**2.8**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.05**	**0.08**	**1.3**	**1.6**	**1.7**
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	<0.5	**120**	<0.5	**0.6**	<0.5
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	**1**	<1	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	**2500**	**390**	<10
Moisture @105C	T162	AR	0.1	%	**15**	**13**	**19**	**13**	**11**
Retained on 2mm	T2	A40	0.1	%	<0.1	**2.4**	**20.1**	**8.1**	**46.5**

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Soil Analysed as Soil
Suite E

				SAL Reference	**580220 015**	**580220 016**	**580220 017**	**580220 018**	**580220 019**
				Customer Sample Reference	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**	**BH3 D24 @ 15.00m**	**BH02 D2 ES2 @ 1.00m**	**BH02 D6 ES5 @ 2.50m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**7**	**4**	**53**	**15**	**17**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	**0.2**	<0.1	**0.3**	**1.5**	**2.4**
Chromium	T257	A40	0.5	mg/kg	**8.7**	**6.1**	**19**	**52**	**30**
Copper	T257	A40	2	mg/kg	**33**	**6**	**6**	**60**	**86**
Lead	T257	A40	2	mg/kg	**64**	**11**	**22**	**130**	**220**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**7.4**	**2.1**	**15**	**23**	**28**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**15**	**13**	**60**	**34**	**38**
Zinc	T257	A40	2	mg/kg	**120**	**32**	**86**	**200**	**530**
Chloride	T686	A40	2	mg/kg	**16**	**15**	**22**	**12**	**560**
pH	T7	A40			**7.4**	**7.2**	**7.9**	**8.6**	**10.6**
Soil Organic Matter	T287	A40	0.1	%	**0.8**	**0.1**	**0.1**	**3.1**	**7.8**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**1.2**	**0.12**	**0.05**	**0.06**	**0.91**
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	<0.5	<0.5	<0.5	**1.0**	**71**
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1	<1	**1**
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	<10	**160**	**1100**
Moisture @105C	T162	AR	0.1	%	**7.2**	**5.3**	**11**	**11**	**13**
Retained on 2mm	T2	A40	0.1	%	<0.1	<0.1	(32) <0.1	**17.3**	**6.1**

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Soil Analysed as Soil
Suite E

					SAL Reference	580220 020	580220 021
					Customer Sample Reference	BH03 D1 ES1 @ 0.50m	BH03 D6 ES5 @ 2.50m
					Date Sampled	02-JUN-2016	02-JUN-2016
					Type	Other	Other
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Arsenic	T257	A40	2	mg/kg		**16**	**13**
Boron (water-soluble)	T82	A40	1	mg/kg		<1	<1
Cadmium	T257	A40	0.1	mg/kg		**1.2**	**0.5**
Chromium	T257	A40	0.5	mg/kg		**85**	**25**
Copper	T257	A40	2	mg/kg		**73**	**56**
Lead	T257	A40	2	mg/kg		**290**	**180**
Mercury	T245	A40	1.0	mg/kg		<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg		**36**	**25**
Selenium	T257	A40	3	mg/kg		<3	<3
Vanadium	T257	A40	0.1	mg/kg		**38**	**37**
Zinc	T257	A40	2	mg/kg		**180**	**220**
Chloride	T686	A40	2	mg/kg		**18**	**20**
pH	T7	A40				**8.9**	**8.9**
Soil Organic Matter	T287	A40	0.1	%		**3.5**	**4.8**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l		**0.19**	**1.6**
Ammonia expressed as NH4	T4	AR	0.5	mg/kg		**0.9**	**1.0**
Cyanide(Total)	T921	AR	1	mg/kg		<1	<1
Cyanide(free)	T921	AR	1	mg/kg		<1	<1
Phenols(Mono)	T921	AR	1	mg/kg		<1	<1
TPH (C10-C40)	T219	AR	10	mg/kg		<10	<10
Moisture @105C	T162	AR	0.1	%		**11**	**12**
Retained on 2mm	T2	A40	0.1	%		**13.5**	**9.7**

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Bulk Product Analysed as Bulk Product
Miscellaneous

					SAL Reference	580220 024
					Customer Sample Reference	BH02 D2 ES2 @ 1.00m
					Date Sampled	06-JUN-2016
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos	T27	AR				Chrysotile Detected

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Customer Reference: 1CO101165

Soil Analysed as Soil
Miscellaneous

					SAL Reference	580220 001	580220 002	580220 005	580220 006	580220 007
					Customer Sample Reference	BH1 D1 @ 0.50m	BH1 D14 @ 7.00m	BH2 D9 @ 4.00m	BH2 D12 @ 6.00m	BH2 D16 @ 9.00m
					Date Sampled	07-JUN-2016	07-JUN-2016	06-JUN-2016	06-JUN-2016	06-JUN-2016
					Type	Sandy Soil	Clay	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Amosite Detected Asbestos not detected	Asbestos not detected

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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**580220 008**	**580220 009**	**580220 013**	**580220 015**	**580220 016**
				Customer Sample Reference	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**	**BH3 D12 @ 6.00m**	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected

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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**580220 017**	**580220 018**	**580220 019**	**580220 022**	**580220 023**
				Customer Sample Reference	**BH3 D24 @ 15.00m**	**BH02 D2 ES2 @ 1.00m**	**BH02 D6 ES5 @ 2.50m**	**BH3 D9 @ 4.00m**	**BH3 D14 @ 7.00m**
				Date Sampled	**01-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Fill**	**Clay**		
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			Asbestos not detected	Chrysotile Detected	Chrysotile Detected	Chrysotile Detected	Asbestos not detected

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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**580220 025**	**580220 026**
				Customer Sample Reference	**BH03 D1 ES1 @ 0.50m**	**BH03 D6 ES5 @ 2.50m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**
				Type		
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected

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Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**580220 001**	**580220 002**	**580220 005**	**580220 006**	**580220 007**
				Customer Sample Reference	**BH1 D1 @ 0.50m**	**BH1 D14 @ 7.00m**	**BH2 D9 @ 4.00m**	**BH2 D12 @ 6.00m**	**BH2 D16 @ 9.00m**
				Date Sampled	**07-JUN-2016**	**07-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.8**	**1.5**	**0.5**
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.1**	**0.2**	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	**2.6**	**1.6**	**0.2**
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**2.2**	**1.3**	**0.2**
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	**1.0**	**0.6**	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	**1.2**	**0.7**	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.9**	**0.4**	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.7**	**0.4**	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.7**	**0.3**	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.5**	**0.3**	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.6**	**0.3**	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1	**12**	**7.8**	**0.9**

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Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**580220 008**	**580220 009**	**580220 012**	**580220 013**	**580220 014**
				Customer Sample Reference	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Other**	**Clay**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.2**	**0.2**	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.6**	**0.4**	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.6**	**0.4**	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.5**	**0.2**	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.6**	**0.3**	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.8**	**0.3**	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.7**	**0.2**	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.6**	**0.2**	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.7**	**0.1**	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	**0.9**	**0.2**	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1	**6.4**	**2.6**	<0.1

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Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**580220 015**	**580220 016**	**580220 017**	**580220 018**	**580220 019**
				Customer Sample Reference	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**	**BH3 D24 @ 15.00m**	**BH02 D2 ES2 @ 1.00m**	**BH02 D6 ES5 @ 2.50m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.1**	**0.4**
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	**0.1**
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**2.6**	**1.1**
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**2.3**	**1.0**
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.3**	**0.6**
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.4**	**0.7**
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.0**	**0.5**
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.1**	**0.4**
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**1.1**	**0.4**
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.4**	**0.2**
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.4**	**0.2**
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**13**	**5.7**

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Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**580220 020**	**580220 021**
				Customer Sample Reference	**BH03 D1 ES1 @ 0.50m**	**BH03 D6 ES5 @ 2.50m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**
				Type	**Other**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	**0.6**	**0.4**
Anthracene	T16	AR	0.1	mg/kg	**0.2**	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	**1.3**	**1.0**
Pyrene	T16	AR	0.1	mg/kg	**1.2**	**0.9**
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	**0.7**	**0.6**
Chrysene	T16	AR	0.1	mg/kg	**0.7**	**0.6**
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	**0.5**	**0.4**
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	**0.5**	**0.4**
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	**0.4**	**0.4**
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	**0.2**	**0.2**
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	**0.2**	**0.2**
PAH(total)	T16	AR	0.1	mg/kg	**6.5**	**4.9**

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Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**580220 001**	**580220 002**	**580220 005**	**580220 006**	**580220 007**
				Customer Sample Reference	**BH1 D1 @ 0.50m**	**BH1 D14 @ 7.00m**	**BH2 D9 @ 4.00m**	**BH2 D12 @ 6.00m**	**BH2 D16 @ 9.00m**
				Date Sampled	**07-JUN-2016**	**07-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	**6**	**90**	**10**
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	**4**	**29**	**2**
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	**10**	**71**	**14**
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	**11**	**68**	**6**
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	**16**	**410**	**51**
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	**30**	**150**	**15**
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	**160**	**760**	**170**
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	**73**	**160**	**31**

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Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**580220 008**	**580220 009**	**580220 012**	**580220 013**	**580220 014**
				Customer Sample Reference	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Other**	**Clay**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	**110**	**7**	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	**63**	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	**67**	**5**	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	**120**	**4**	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	**99**	**33**	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	**140**	**11**	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	**1200**	**300**	<2
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	**600**	**15**	<2

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Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**580220 015**	**580220 016**	**580220 017**	**580220 018**	**580220 019**
				Customer Sample Reference	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**	**BH3 D24 @ 15.00m**	**BH02 D2 ES2 @ 1.00m**	**BH02 D6 ES5 @ 2.50m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	**9**	**73**
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**21**
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	**4**	**31**
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	**5**	**47**
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	**4**	**18**
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	**13**	**43**
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	**63**	**540**
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	**45**	**180**

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Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**580220 020**	**580220 021**
				Customer Sample Reference	**BH03 D1 ES1 @ 0.50m**	**BH03 D6 ES5 @ 2.50m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**
				Type	**Other**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Benzene	T209	AR	10	µg/kg	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2

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Soil Analysed as Soil
VOC (SE)

				SAL Reference	**580220 005**	**580220 006**	**580220 007**	**580220 008**	**580220 009**
				Customer Sample Reference	**BH2 D9 @ 4.00m**	**BH2 D12 @ 6.00m**	**BH2 D16 @ 9.00m**	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,1,1-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,1,2-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	<10	<10	<10	<10	<10
1,2-dibromoethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,2-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3-Dichloropropane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
2,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
2-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
4-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Bromobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromochloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromodichloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromoform	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Bromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Carbon tetrachloride	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chlorodibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Chloroform	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chloromethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Dibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Dichlorodifluoromethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Hexachlorobutadiene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Isopropyl benzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
m/p ethyl toluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
n-Butylbenzene	T54	AR	10	µg/kg	<10	<10	<10	<10	<10
n-Propylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
p-Isopropyltoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
S-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Styrene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
T-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Tertiary amyl methyl ether	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Tetrachloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Trichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5

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Soil Analysed as Soil
VOC (SE)

				SAL Reference	**580220 005**	**580220 006**	**580220 007**	**580220 008**	**580220 009**
				Customer Sample Reference	**BH2 D9 @ 4.00m**	**BH2 D12 @ 6.00m**	**BH2 D16 @ 9.00m**	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Trichlorofluoromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Vinyl chloride	T54	AR	10	µg/kg	<10	<10	<10	<10	<10

SAL Reference: 580220
Project Site: Iberdrola
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Soil Analysed as Soil
VOC (SE)

				SAL Reference	**580220 012**	**580220 013**	**580220 014**	**580220 015**	**580220 016**
				Customer Sample Reference	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Other**	**Clay**	**Other**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,1,1-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,1,2-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	<10	<10	<10	<10	<10
1,2-dibromoethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,2-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3-Dichloropropane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
2,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
2-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
4-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Bromobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromochloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromodichloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromoform	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Bromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Carbon tetrachloride	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chlorodibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Chloroform	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chloromethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Dibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Dichlorodifluoromethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Hexachlorobutadiene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Isopropyl benzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
m/p ethyl toluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
n-Butylbenzene	T54	AR	10	µg/kg	<10	<10	<10	<10	<10
n-Propylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
p-Isopropyltoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
S-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Styrene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
T-Butylbenzene	T54	AR	5	µg/kg	**26**	<5	<5	<5	<5
Tertiary amyl methyl ether	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Tetrachloroethene	T54	AR	5	µg/kg	**42**	**24**	**16**	<5	<5
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Trichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
VOC (SE)

				SAL Reference	**580220 012**	**580220 013**	**580220 014**	**580220 015**	**580220 016**
				Customer Sample Reference	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Other**	**Clay**	**Other**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Trichlorofluoromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Vinyl chloride	T54	AR	10	µg/kg	<10	<10	<10	<10	<10

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
VOC (SE)

	SAL Reference	580220 017	580220 018	580220 019	580220 020	580220 021
	Customer Sample Reference	BH3 D24 @ 15.00m	BH02 D2 ES2 @ 1.00m	BH02 D6 ES5 @ 2.50m	BH03 D1 ES1 @ 0.50m	BH03 D6 ES5 @ 2.50m
	Date Sampled	01-JUN-2016	06-JUN-2016	06-JUN-2016	02-JUN-2016	02-JUN-2016
	Type	Sandy Soil	Fill	Clay	Other	Other

Determinand	Method	Test Sample	LOD	Units					
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,1,1-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,1,2-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,1-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,3-Trichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	<10	<10	<10	<10	<10
1,2-dibromoethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,2-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
1,3-Dichloropropane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
2,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
2-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
4-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Bromobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromochloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromodichloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Bromoform	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Bromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Carbon tetrachloride	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chlorodibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Chloroform	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Chloromethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Dibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Dichlorodifluoromethane	T209	AR	50	µg/kg	<50	<50	<50	<50	<50
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Hexachlorobutadiene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Isopropyl benzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
m/p ethyl toluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
n-Butylbenzene	T54	AR	10	µg/kg	<10	<10	<10	<10	<10
n-Propylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
p-Isopropyltoluene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
S-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Styrene	T54	AR	50	µg/kg	<50	<50	<50	<50	<50
T-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Tertiary amyl methyl ether	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Tetrachloroethene	T54	AR	5	µg/kg	<5	<5	**7**	<5	**14**
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
VOC (SE)

	SAL Reference	580220 017	580220 018	580220 019	580220 020	580220 021
	Customer Sample Reference	BH3 D24 @ 15.00m	BH02 D2 ES2 @ 1.00m	BH02 D6 ES5 @ 2.50m	BH03 D1 ES1 @ 0.50m	BH03 D6 ES5 @ 2.50m
	Date Sampled	01-JUN-2016	06-JUN-2016	06-JUN-2016	02-JUN-2016	02-JUN-2016
	Type	Sandy Soil	Fill	Clay	Other	Other

Determinand	Method	Test Sample	LOD	Units					
Trichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane	T54	AR	5	µg/kg	<5	<5	<5	<5	<5
Vinyl chloride	T54	AR	10	µg/kg	<10	<10	<10	<10	<10

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Suite A3

	SAL Reference	580220 001	580220 002	580220 005	580220 006	580220 007
	Customer Sample Reference	BH1 D1 @ 0.50m	BH1 D14 @ 7.00m	BH2 D9 @ 4.00m	BH2 D12 @ 6.00m	BH2 D16 @ 9.00m
	Date Sampled	07-JUN-2016	07-JUN-2016	06-JUN-2016	06-JUN-2016	06-JUN-2016
	Type	Sandy Soil	Clay	Sandy Soil	Sandy Soil	Sandy Soil

Determinand	Method	Test Sample	LOD	Units					
As (Dissolved)	T281	10:1	0.0002	mg/l	**0.0046**	**0.0010**	**0.011**	**0.015**	**0.014**
B (Dissolved)	T281	10:1	0.05	mg/l	<0.05	<0.05	**0.23**	**0.21**	**0.10**
Cd (Dissolved)	T281	10:1	0.00002	mg/l	**0.00003**	**0.00003**	**0.00034**	**0.00040**	**0.00007**
Cr (Dissolved)	T281	10:1	0.001	mg/l	**0.002**	**0.002**	<0.001	**0.001**	**0.002**
Cu (Dissolved)	T281	10:1	0.0005	mg/l	**0.0010**	**0.0040**	**0.029**	**0.039**	**0.010**
Pb (Dissolved)	T281	10:1	0.0003	mg/l	**0.0018**	**0.0036**	<0.0003	<0.0003	**0.0020**
Hg (Dissolved)	T281	10:1	0.00005	mg/l	<0.00005	<0.00005	**0.00007**	**0.00005**	<0.00005
Ni (Dissolved)	T281	10:1	0.001	mg/l	**0.005**	**0.002**	**0.018**	**0.034**	**0.003**
Se (Dissolved)	T281	10:1	0.0005	mg/l	<0.0005	**0.0008**	**0.0025**	**0.0030**	**0.0006**
Zn (Dissolved)	T281	10:1	0.002	mg/l	**0.010**	**0.005**	**0.085**	**0.089**	**0.031**
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	<0.05	<0.05	**14**	**92**	**20**
Cyanide(Total)	T546	10:1	0.01	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	**2**	**2**	**2**	**4**	**3**
pH	T7	10:1			**7.8**	**7.9**	**7.9**	**7.7**	**7.8**
Chemical Oxygen Demand	T221	10:1	20	mg/l	<20	<20	<20	<20	<20
Chloride	T686	10:1	1	mg/l	**2**	**1**	**12**	**7**	**3**
Phenols(Mono)	T546	10:1	0.02	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02
Sulphate	T686	10:1	0.5	mg/l	**1.6**	**6.1**	**320**	**890**	**110**
Nitrate	T686	10:1	0.5	mg/l	<0.5	<0.5	**1.2**	**4.4**	<0.5
Nitrite	T686	10:1	0.1	mg/l	<0.1	<0.1	**0.2**	**0.8**	<0.1
TPH (C10-C40)	T219	10:1	20	µg/l	**160**	**150**	**270**	**380**	**250**
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	**18**	**27**	**320**	**580**	**39**

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Suite A3 Analysed as Water

				SAL Reference	**580220 008**	**580220 009**	**580220 012**	**580220 013**	**580220 014**
				Customer Sample Reference	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Other**	**Clay**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
As (Dissolved)	T281	10:1	0.0002	mg/l	**0.0020**	**0.011**	**0.0010**	**0.0090**	**0.0079**
B (Dissolved)	T281	10:1	0.05	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Cd (Dissolved)	T281	10:1	0.00002	mg/l	**0.00004**	**0.00003**	**0.00007**	**0.0012**	**0.00009**
Cr (Dissolved)	T281	10:1	0.001	mg/l	<0.001	<0.001	**0.005**	<0.001	<0.001
Cu (Dissolved)	T281	10:1	0.0005	mg/l	**0.0028**	**0.0007**	**0.024**	**0.0077**	**0.010**
Pb (Dissolved)	T281	10:1	0.0003	mg/l	**0.0019**	**0.0006**	<0.0003	<0.0003	<0.0003
Hg (Dissolved)	T281	10:1	0.00005	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Ni (Dissolved)	T281	10:1	0.001	mg/l	**0.002**	**0.001**	**0.008**	**0.029**	**0.031**
Se (Dissolved)	T281	10:1	0.0005	mg/l	<0.0005	<0.0005	<0.0005	**0.0020**	**0.0013**
Zn (Dissolved)	T281	10:1	0.002	mg/l	**0.033**	**0.003**	**0.008**	**0.030**	**0.011**
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	**4.1**	**4.2**	<0.05	<0.05	<0.05
Cyanide(Total)	T546	10:1	0.01	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	**2**	**1**	**2**	**2**	**3**
pH	T7	10:1			**8.0**	**7.6**	**8.1**	**7.5**	**7.6**
Chemical Oxygen Demand	T221	10:1	20	mg/l	<20	<20	<20	**150**	**190**
Chloride	T686	10:1	1	mg/l	**3**	**4**	**4**	**2**	**2**
Phenols(Mono)	T546	10:1	0.02	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02
Sulphate	T686	10:1	0.5	mg/l	**12**	**11**	**170**	**1200**	**1100**
Nitrate	T686	10:1	0.5	mg/l	**1.3**	**1.5**	<0.5	<0.5	**1.4**
Nitrite	T686	10:1	0.1	mg/l	**0.1**	<0.1	<0.1	<0.1	<0.1
TPH (C10-C40)	T219	10:1	20	µg/l	**160**	**120**	**750**	**330**	**160**
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	**26**	<10	**240**	**1400**	**1300**

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Suite A3 Analysed as Water

				SAL Reference	**580220 015**	**580220 016**	**580220 017**	**580220 018**	**580220 019**
				Customer Sample Reference	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**	**BH3 D24 @ 15.00m**	**BH02 D2 ES2 @ 1.00m**	**BH02 D6 ES5 @ 2.50m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
As (Dissolved)	T281	10:1	0.0002	mg/l	**0.0040**	**0.011**	**0.0018**	**0.0009**	**0.0028**
B (Dissolved)	T281	10:1	0.05	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Cd (Dissolved)	T281	10:1	0.00002	mg/l	**0.00003**	<0.00002	<0.00002	**0.00007**	**0.00004**
Cr (Dissolved)	T281	10:1	0.001	mg/l	<0.001	<0.001	**0.002**	**0.008**	<0.001
Cu (Dissolved)	T281	10:1	0.0005	mg/l	**0.0035**	**0.0020**	<0.0005	**0.0048**	**0.0044**
Pb (Dissolved)	T281	10:1	0.0003	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Hg (Dissolved)	T281	10:1	0.00005	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Ni (Dissolved)	T281	10:1	0.001	mg/l	**0.004**	**0.001**	<0.001	**0.002**	**0.004**
Se (Dissolved)	T281	10:1	0.0005	mg/l	**0.0006**	<0.0005	<0.0005	**0.0008**	**0.0017**
Zn (Dissolved)	T281	10:1	0.002	mg/l	**0.003**	**0.002**	**0.002**	**0.002**	**0.002**
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	**0.30**	<0.05	<0.05	<0.05	**0.06**
Cyanide(Total)	T546	10:1	0.01	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	**3**	**2**	**2**	**3**	**3**
pH	T7	10:1			**7.7**	**7.6**	**7.6**	**8.3**	**7.9**
Chemical Oxygen Demand	T221	10:1	20	mg/l	<20	<20	<20	<20	<20
Chloride	T686	10:1	1	mg/l	**1**	**1**	**2**	**2**	**34**
Phenols(Mono)	T546	10:1	0.02	mg/l	<0.02	<0.02	**0.03**	<0.02	<0.02
Sulphate	T686	10:1	0.5	mg/l	**140**	**39**	**5.6**	**5.4**	**94**
Nitrate	T686	10:1	0.5	mg/l	<0.5	**1.4**	**0.9**	**3.8**	**14**
Nitrite	T686	10:1	0.1	mg/l	<0.1	<0.1	<0.1	<0.1	**0.2**
TPH (C10-C40)	T219	10:1	20	µg/l	**160**	**210**	**200**	**180**	**270**
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	**160**	**53**	**14**	**57**	**180**

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Suite A3

				SAL Reference	**580220 020**	**580220 021**
				Customer Sample Reference	**BH03 D1 ES1 @ 0.50m**	**BH03 D6 ES5 @ 2.50m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**
				Type	**Other**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
As (Dissolved)	T281	10:1	0.0002	mg/l	**0.0009**	**0.0018**
B (Dissolved)	T281	10:1	0.05	mg/l	<0.05	<0.05
Cd (Dissolved)	T281	10:1	0.00002	mg/l	**0.00004**	**0.00004**
Cr (Dissolved)	T281	10:1	0.001	mg/l	**0.004**	**0.004**
Cu (Dissolved)	T281	10:1	0.0005	mg/l	**0.0030**	**0.0027**
Pb (Dissolved)	T281	10:1	0.0003	mg/l	**0.0005**	<0.0003
Hg (Dissolved)	T281	10:1	0.00005	mg/l	**0.00006**	<0.00005
Ni (Dissolved)	T281	10:1	0.001	mg/l	**0.002**	**0.013**
Se (Dissolved)	T281	10:1	0.0005	mg/l	<0.0005	**0.0006**
Zn (Dissolved)	T281	10:1	0.002	mg/l	**0.002**	**0.004**
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	<0.05	<0.05
Cyanide(Total)	T546	10:1	0.01	mg/l	<0.01	<0.01
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	**3**	**2**
pH	T7	10:1			**8.0**	**7.8**
Chemical Oxygen Demand	T221	10:1	20	mg/l	<20	<20
Chloride	T686	10:1	1	mg/l	**2**	**2**
Phenols(Mono)	T546	10:1	0.02	mg/l	<0.02	<0.02
Sulphate	T686	10:1	0.5	mg/l	**18**	**670**
Nitrate	T686	10:1	0.5	mg/l	**3.1**	**1.8**
Nitrite	T686	10:1	0.1	mg/l	<0.1	<0.1
TPH (C10-C40)	T219	10:1	20	µg/l	**260**	**260**
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	**64**	**740**

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Total and Speciated USEPA16 PAH (SE)

				SAL Reference	**580220 001**	**580220 002**	**580220 005**	**580220 006**	**580220 007**
				Customer Sample Reference	**BH1 D1 @ 0.50m**	**BH1 D14 @ 7.00m**	**BH2 D9 @ 4.00m**	**BH2 D12 @ 6.00m**	**BH2 D16 @ 9.00m**
				Date Sampled	**07-JUN-2016**	**07-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	T149	10:1	0.01	µg/l	**0.03**	<0.01	<0.01	<0.01	<0.01
Phenanthrene	T149	10:1	0.01	µg/l	**0.04**	<0.01	<0.01	<0.01	<0.01
Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	**0.02**	**0.04**
Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	**0.03**	**0.02**
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
PAH(total)	T149	10:1	0.01	µg/l	**0.08**	<0.01	<0.01	**0.06**	**0.06**

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Total and Speciated USEPA16 PAH (SE)

				SAL Reference	**580220 008**	**580220 009**	**580220 012**	**580220 013**	**580220 014**
				Customer Sample Reference	**BH2 D19 @ 11.00m**	**BH2 D24 @ 15.00m**	**BH3 D9 @ 4.00m**	**BH3 D12 @ 6.00m**	**BH3 D14 @ 7.00m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Other**	**Clay**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
PAH(total)	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Total and Speciated USEPA16 PAH (SE)

				SAL Reference	**580220 015**	**580220 016**	**580220 017**	**580220 018**	**580220 019**
				Customer Sample Reference	**BH3 D16 @ 9.00m**	**BH3 D18 @ 10.00m**	**BH3 D24 @ 15.00m**	**BH02 D2 ES2 @ 1.00m**	**BH02 D6 ES5 @ 2.50m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	**0.05**	<0.01	<0.01
Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	**0.04**	<0.01	<0.01
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
PAH(total)	T149	10:1	0.01	µg/l	<0.01	<0.01	**0.08**	<0.01	<0.01

SAL Reference: 580220
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Total and Speciated USEPA16 PAH (SE)

				SAL Reference	**580220 020**	**580220 021**
				Customer Sample Reference	**BH03 D1 ES1 @ 0.50m**	**BH03 D6 ES5 @ 2.50m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**
				Type	**Other**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T149	10:1	0.01	µg/l	<0.01	<0.01
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01	<0.01
Acenaphthene	T149	10:1	0.01	µg/l	<0.01	<0.01
Fluorene	T149	10:1	0.01	µg/l	<0.01	<0.01
Phenanthrene	T149	10:1	0.01	µg/l	<0.01	<0.01
Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01
Fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01
Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01
Chrysene	T149	10:1	0.01	µg/l	<0.01	<0.01
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01	<0.01
PAH(total)	T149	10:1	0.01	µg/l	<0.01	<0.01

Index to symbols used in 580220-4

Value	Description
AR	As Received
A40	Assisted dried < 40C
10:1	Leachate
32	Whole sample was crushed
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Retained on 2mm is removed before analysis
All samples except 018-020 - These samples were received in containers that are inappropriate for this parameter of interest. It is possible therefore that the results provided may be compromised.
Phenol, PAHs & TPH c10-c40 - These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised.
Asbestos subcontracted to REC Limited
Reported results on as received samples are corrected to a 105 degree centigrade dry weight basis except TPH c5-c35 aro/ali split and Ammonia

Method Index

Value	Description
T4	Colorimetry
T7	Probe
T649	ICP/OES (Calc)
T162	Grav (1 Dec) (105 C)
T149	GC/MS (SIR)
T209	GC/MS (Head Space)(MCERTS)
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T16	GC/MS
T82	ICP/OES (Sim)
T219	GC/FID (SE)
T546	Colorimetry (CF)
T686	Discrete Analyser
T245	ICP/OES (Aqua Regia Extraction)
T54	GC/MS (Headspace)

T921	Colorimetry (CF) (MCERT)
T281	ICP/MS (Filtered)
T221	Colorimetry (CE)
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T264	Probe (Incubation Carbonaceous) (5 Days)
T287	Calc TOC/0.58
T2	Grav
T27	PLM

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Asbestos	T27	AR			SU	024
Asbestos ID	T27	A40			SU	001-002,005-009,013,015-019,022-023,025-026
Benzene	T209	AR	10	µg/kg	M	001-002,005-009,013,015-017,019
Benzene	T209	AR	10	µg/kg	N	012,014,020-021
Benzene	T209	AR	10	µg/kg	U	018
EthylBenzene	T209	AR	10	µg/kg	M	001-002,005-009,013,015-017,019
EthylBenzene	T209	AR	10	µg/kg	N	012,014,020-021
EthylBenzene	T209	AR	10	µg/kg	U	018
M/P Xylene	T209	AR	10	µg/kg	M	001-002,005-009,013,015-017,019
M/P Xylene	T209	AR	10	µg/kg	U	018
O Xylene	T209	AR	10	µg/kg	M	001-002,005-009,013,015-017,019
O Xylene	T209	AR	10	µg/kg	U	018
Toluene	T209	AR	10	µg/kg	M	001-002,005-009,013,015-017,019
Toluene	T209	AR	10	µg/kg	U	018
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	M	001-002,005-009,013,015-017,019
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	N	012,014,020-021
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	N	001-002,005-009,012-021
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	N	001-002,005-009,012-021
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	N	001-002,005-009,012-021
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	N	001-002,005-009,012-021
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	N	001-002,005-009,012-021
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	N	001-002,005-009,012-021
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	N	001-002,005-009,012-021
As (Dissolved)	T281	10:1	0.0002	mg/l	U	001-002,005-009,012-021
B (Dissolved)	T281	10:1	0.05	mg/l	U	001-002,005-009,012-021
Cd (Dissolved)	T281	10:1	0.00002	mg/l	U	001-002,005-009,012-021
Cr (Dissolved)	T281	10:1	0.001	mg/l	U	001-002,005-009,012-021
Cu (Dissolved)	T281	10:1	0.0005	mg/l	U	001-002,005-009,012-021
Pb (Dissolved)	T281	10:1	0.0003	mg/l	U	001-002,005-009,012-021
Hg (Dissolved)	T281	10:1	0.00005	mg/l	U	001-002,005-009,012-021
Ni (Dissolved)	T281	10:1	0.001	mg/l	U	001-002,005-009,012-021
Se (Dissolved)	T281	10:1	0.0005	mg/l	U	001-002,005-009,012-021
Zn (Dissolved)	T281	10:1	0.002	mg/l	U	001-002,005-009,012-021
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	U	001-002,005-009,012-021
Cyanide(Total)	T546	10:1	0.01	mg/l	U	001-002,005-009,012-021
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	N	001-002,005-009,012-021
Chemical Oxygen Demand	T221	10:1	20	mg/l	N	001-002,005-009,012-021
pH	T7	10:1			N	001-002,005-009,012-021
Chloride	T686	10:1	1	mg/l	U	001-002,005-009,012-021
Phenols(Mono)	T546	10:1	0.02	mg/l	U	001-002,005-009,012-021
Nitrate	T686	10:1	0.5	mg/l	U	001-002,005-009,012-021
Sulphate	T686	10:1	0.5	mg/l	U	001-002,005-009,012-021
Nitrite	T686	10:1	0.1	mg/l	U	001-002,005-009,012-021
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	U	001-002,005-009,012-021
TPH (C10-C40)	T219	10:1	20	µg/l	N	001-002,005-009,012-021
Arsenic	T257	A40	2	mg/kg	M	001-002,005-009,013,015-017,019
Arsenic	T257	A40	2.0	mg/kg	N	012,014,020-021
Arsenic	T257	A40	2.0	mg/kg	U	018
Boron (water-soluble)	T82	A40	1	mg/kg	N	001-002,005-009,012-021
Cadmium	T257	A40	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Cadmium	T257	A40	0.1	mg/kg	N	012,014,020-021

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Cadmium	T257	A40	0.1	mg/kg	U	018
Chromium	T257	A40	0.5	mg/kg	M	001-002,005-009,013,015-017,019
Chromium	T257	A40	0.5	mg/kg	N	012,014,020-021
Chromium	T257	A40	0.5	mg/kg	U	018
Copper	T257	A40	2	mg/kg	M	001-002,005-009,013,015-017,019
Copper	T257	A40	2	mg/kg	N	012,014,020-021
Copper	T257	A40	2	mg/kg	U	018
Lead	T257	A40	2	mg/kg	M	001-002,005-009,013,015-017,019
Lead	T257	A40	2	mg/kg	N	012,014,020-021
Lead	T257	A40	2	mg/kg	U	018
Mercury	T245	A40	1.0	mg/kg	U	001-002,005-009,013,015-019
Mercury	T245	A40	1.0	mg/kg	N	012,014,020-021
Nickel	T257	A40	0.5	mg/kg	M	001-002,005-009,013,015-017,019
Nickel	T257	A40	0.5	mg/kg	N	012,014,020-021
Nickel	T257	A40	0.5	mg/kg	U	018
Selenium	T257	A40	3	mg/kg	U	001-002,005-009,013,015-019
Selenium	T257	A40	3	mg/kg	N	012,014,020-021
Vanadium	T257	A40	0.1	mg/kg	U	001-002,005-009,013,015-019
Vanadium	T257	A40	0.1	mg/kg	N	012,014,020-021
Zinc	T257	A40	2	mg/kg	M	001-002,005-009,013,015-017,019
Zinc	T257	A40	2	mg/kg	N	012,014,020-021
Zinc	T257	A40	2	mg/kg	U	018
Chloride	T686	A40	2	mg/kg	N	001-002,005-009,012-021
pH	T7	A40			M	001-002,005-009,013,015-017,019
pH	T7	A40			N	012,014,020-021
pH	T7	A40			U	018
Soil Organic Matter	T287	A40	0.1	%	N	001-002,005-009,012-021
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	M	001-002,005-009,013,015-017,019
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	N	012,014,020-021
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	U	018
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	N	001-002,005-009,012-021
Cyanide(Total)	T921	AR	1	mg/kg	M	001-002,005-009,013,015-017,019
Cyanide(Total)	T921	AR	1	mg/kg	N	012,014,020-021
Cyanide(Total)	T921	AR	1	mg/kg	U	018
Cyanide(free)	T921	AR	1	mg/kg	M	001-002,005-009,013,015-017,019
Cyanide(free)	T921	AR	1	mg/kg	N	012,014,020-021
Cyanide(free)	T921	AR	1	mg/kg	U	018
Phenols(Mono)	T921	AR	1	mg/kg	M	001-002,005-009,013,015-017,019
Phenols(Mono)	T921	AR	1	mg/kg	N	012,014,020-021
Phenols(Mono)	T921	AR	1	mg/kg	U	018
TPH (C10-C40)	T219	AR	10	mg/kg	M	001-002,005-009,013,015-017,019
TPH (C10-C40)	T219	AR	10	mg/kg	N	012,014,020-021
TPH (C10-C40)	T219	AR	10	mg/kg	U	018
Moisture @105C	T162	AR	0.1	%	N	001-002,005-009,012-021
Retained on 2mm	T2	A40	0.1	%	N	001-002,005-009,012-021
Naphthalene	T16	AR	0.1	mg/kg	U	001-002,005-009,013,015-019
Naphthalene	T16	AR	0.1	mg/kg	N	012,014,020-021
Acenaphthylene	T16	AR	0.1	mg/kg	U	001-002,005-009,013,015-019
Acenaphthylene	T16	AR	0.1	mg/kg	N	012,014,020-021
Acenaphthene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Acenaphthene	T16	AR	0.1	mg/kg	N	012,014,020-021
Acenaphthene	T16	AR	0.1	mg/kg	U	018
Fluorene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Fluorene	T16	AR	0.1	mg/kg	N	012,014,020-021
Fluorene	T16	AR	0.1	mg/kg	U	018
Phenanthrene	T16	AR	0.1	mg/kg	U	001-002,005-009,013,015-019
Phenanthrene	T16	AR	0.1	mg/kg	N	012,014,020-021
Anthracene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Anthracene	T16	AR	0.1	mg/kg	N	012,014,020-021
Anthracene	T16	AR	0.1	mg/kg	U	018
Fluoranthene	T16	AR	0.1	mg/kg	N	001-002,005-009,012-021
Pyrene	T16	AR	0.1	mg/kg	N	001-002,005-009,012-021
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	N	012,014,020-021
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	U	018
Chrysene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Chrysene	T16	AR	0.1	mg/kg	N	012,014,020-021
Chrysene	T16	AR	0.1	mg/kg	U	018
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	U	001-002,005-009,013,015-019
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	N	012,014,020-021

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	N	001-002,005-009,012-021
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	N	012,014,020-021
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	U	018
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	N	012,014,020-021
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	U	018
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	N	012,014,020-021
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	U	018
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	M	001-002,005-009,013,015-017,019
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	N	012,014,020-021
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	U	018
PAH(total)	T16	AR	0.1	mg/kg	U	001-002,005-009,013,015-019
PAH(total)	T16	AR	0.1	mg/kg	N	012,014,020-021
Naphthalene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Acenaphthylene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Acenaphthene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Fluorene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Phenanthrene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Anthracene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Fluoranthene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Pyrene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Chrysene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
PAH(total)	T149	10:1	0.01	µg/l	N	001-002,005-009,012-021
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	U	005-009,013,015-019
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	N	012,014,020-021
1,1,1-Trichloroethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,1,1-Trichloroethane	T54	AR	5	µg/kg	N	012,014,020-021
1,1,1-Trichloroethane	T54	AR	5	µg/kg	U	018
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	U	005-009,013,015-019
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	N	012,014,020-021
1,1,2-Trichloroethane	T54	AR	5	µg/kg	U	005-009,013,015-019
1,1,2-Trichloroethane	T54	AR	5	µg/kg	N	012,014,020-021
1,1-Dichloroethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,1-Dichloroethane	T54	AR	5	µg/kg	N	012,014,020-021
1,1-Dichloroethane	T54	AR	5	µg/kg	U	018
1,1-Dichloroethylene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,1-Dichloroethylene	T54	AR	5	µg/kg	N	012,014,020-021
1,1-Dichloroethylene	T54	AR	5	µg/kg	U	018
1,1-Dichloropropene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,1-Dichloropropene	T54	AR	5	µg/kg	N	012,014,020-021
1,1-Dichloropropene	T54	AR	5	µg/kg	U	018
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	N	012,014,020-021
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	U	018
1,2,3-Trichloropropane	T54	AR	5	µg/kg	U	005-009,013,015-019
1,2,3-Trichloropropane	T54	AR	5	µg/kg	N	012,014,020-021
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	N	012,014,020-021
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	U	018
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	M	005-009,013,015-017,019
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	N	012,014,020-021
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	U	018
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	U	005-009,013,015-019
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	N	012,014,020-021
1,2-dibromoethane	T209	AR	50	µg/kg	U	005-009,013,015-019
1,2-dibromoethane	T209	AR	50	µg/kg	N	012,014,020-021
1,2-Dichlorobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,2-Dichlorobenzene	T54	AR	5	µg/kg	N	012,014,020-021
1,2-Dichlorobenzene	T54	AR	5	µg/kg	U	018
1,2-Dichloroethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,2-Dichloroethane	T54	AR	5	µg/kg	N	012,014,020-021

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
1,2-Dichloroethane	T54	AR	5	µg/kg	U	018
1,2-Dichloropropane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,2-Dichloropropane	T54	AR	5	µg/kg	N	012,014,020-021
1,2-Dichloropropane	T54	AR	5	µg/kg	U	018
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	N	012,014,020-021
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	U	018
1,3-Dichlorobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,3-Dichlorobenzene	T54	AR	5	µg/kg	N	012,014,020-021
1,3-Dichlorobenzene	T54	AR	5	µg/kg	U	018
1,3-Dichloropropane	T209	AR	50	µg/kg	U	005-009,013,015-019
1,3-Dichloropropane	T209	AR	50	µg/kg	N	012,014,020-021
1,4-Dichlorobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
1,4-Dichlorobenzene	T54	AR	5	µg/kg	N	012,014,020-021
1,4-Dichlorobenzene	T54	AR	5	µg/kg	U	018
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	N	012,014,020-021
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	U	018
2,2-Dichloropropane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
2,2-Dichloropropane	T54	AR	5	µg/kg	N	012,014,020-021
2,2-Dichloropropane	T54	AR	5	µg/kg	U	018
2-Chlorotoluene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
2-Chlorotoluene	T54	AR	5	µg/kg	N	012,014,020-021
2-Chlorotoluene	T54	AR	5	µg/kg	U	018
4-Chlorotoluene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
4-Chlorotoluene	T54	AR	5	µg/kg	N	012,014,020-021
4-Chlorotoluene	T54	AR	5	µg/kg	U	018
Bromobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Bromobenzene	T54	AR	5	µg/kg	N	012,014,020-021
Bromobenzene	T54	AR	5	µg/kg	U	018
Bromochloromethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Bromochloromethane	T54	AR	5	µg/kg	N	012,014,020-021
Bromochloromethane	T54	AR	5	µg/kg	U	018
Bromodichloromethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Bromodichloromethane	T54	AR	5	µg/kg	N	012,014,020-021
Bromodichloromethane	T54	AR	5	µg/kg	U	018
Bromoform	T209	AR	50	µg/kg	U	005-009,013,015-019
Bromoform	T209	AR	50	µg/kg	N	012,014,020-021
Bromomethane	T54	AR	5	µg/kg	U	005-009,013,015-019
Bromomethane	T54	AR	5	µg/kg	N	012,014,020-021
Carbon tetrachloride	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Carbon tetrachloride	T54	AR	5	µg/kg	N	012,014,020-021
Carbon tetrachloride	T54	AR	5	µg/kg	U	018
Chlorobenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Chlorobenzene	T54	AR	5	µg/kg	N	012,014,020-021
Chlorobenzene	T54	AR	5	µg/kg	U	018
Chlorodibromomethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Chlorodibromomethane	T54	AR	5	µg/kg	N	012,014,020-021
Chlorodibromomethane	T54	AR	5	µg/kg	U	018
Chloroethane	T209	AR	50	µg/kg	U	005-009,013,015-019
Chloroethane	T209	AR	50	µg/kg	N	012,014,020-021
Chloroform	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Chloroform	T54	AR	5	µg/kg	N	012,014,020-021
Chloroform	T54	AR	5	µg/kg	U	018
Chloromethane	T209	AR	50	µg/kg	N	005-009,012-021
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	N	012,014,020-021
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	U	018
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	N	012,014,020-021
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	U	018
Dibromomethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Dibromomethane	T54	AR	5	µg/kg	N	012,014,020-021
Dibromomethane	T54	AR	5	µg/kg	U	018
Dichlorodifluoromethane	T209	AR	50	µg/kg	N	005-009,012-021
Hexachlorobutadiene	T209	AR	10	µg/kg	U	005-009,013,015-019
Hexachlorobutadiene	T209	AR	10	µg/kg	N	012,014,020-021
Isopropyl benzene	T54	AR	50	µg/kg	M	005-009,013,015-017,019
Isopropyl benzene	T54	AR	50	µg/kg	N	012,014,020-021
Isopropyl benzene	T54	AR	50	µg/kg	U	018

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
m/p ethyl toluene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
m/p ethyl toluene	T54	AR	5	µg/kg	N	012,014,020-021
m/p ethyl toluene	T54	AR	5	µg/kg	U	018
M/P Xylene	T209	AR	10	µg/kg	N	012,014,020-021
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	U	018
n-Butylbenzene	T54	AR	10	µg/kg	U	005-009,013,015-019
n-Butylbenzene	T54	AR	10	µg/kg	N	012,014,020-021
n-Propylbenzene	T54	AR	50	µg/kg	M	005-009,013,015-017,019
n-Propylbenzene	T54	AR	50	µg/kg	N	012,014,020-021
n-Propylbenzene	T54	AR	50	µg/kg	U	018
O Xylene	T209	AR	10	µg/kg	N	012,014,020-021
p-Isopropyltoluene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
p-Isopropyltoluene	T54	AR	5	µg/kg	N	012,014,020-021
p-Isopropyltoluene	T54	AR	5	µg/kg	U	018
S-Butylbenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
S-Butylbenzene	T54	AR	5	µg/kg	N	012,014,020-021
S-Butylbenzene	T54	AR	5	µg/kg	U	018
Styrene	T54	AR	50	µg/kg	M	005-009,013,015-017,019
Styrene	T54	AR	50	µg/kg	N	012,014,020-021
Styrene	T54	AR	50	µg/kg	U	018
T-Butylbenzene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
T-Butylbenzene	T54	AR	5	µg/kg	N	012,014,020-021
T-Butylbenzene	T54	AR	5	µg/kg	U	018
Tertiary amyl methyl ether	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Tertiary amyl methyl ether	T54	AR	5	µg/kg	N	012,014,020-021
Tertiary amyl methyl ether	T54	AR	5	µg/kg	U	018
Tetrachloroethene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Tetrachloroethene	T54	AR	5	µg/kg	N	012,014,020-021
Tetrachloroethene	T54	AR	5	µg/kg	U	018
Toluene	T209	AR	10	µg/kg	N	012,014,020-021
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	N	012,014,020-021
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	U	018
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	N	012,014,020-021
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	U	018
Trichloroethene	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Trichloroethene	T54	AR	5	µg/kg	N	012,014,020-021
Trichloroethene	T54	AR	5	µg/kg	U	018
Trichlorofluoromethane	T54	AR	5	µg/kg	M	005-009,013,015-017,019
Trichlorofluoromethane	T54	AR	5	µg/kg	N	012,014,020-021
Trichlorofluoromethane	T54	AR	5	µg/kg	U	018
Vinyl chloride	T54	AR	10	µg/kg	M	005-009,013,015-017,019
Vinyl chloride	T54	AR	10	µg/kg	N	012,014,020-021
Vinyl chloride	T54	AR	10	µg/kg	U	018

SCIENTIFIC ANALYSIS LABORATORIES
DELIVERING SCIENCE

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: 583339-1

Date of Report: 19-Jul-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 00135
Customer Site Reference: Iberdrola
Date Job Received at SAL: 07-Jun-2016
Date Analysis Started: 07-Jul-2016
Date Analysis Completed: 15-Jul-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Tests covered by this certificate were conducted in accordance with SAL SOPs

All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

Report checked and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Claire Brown Crociquia
Customer Service Manager

SAL Reference: 583339
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Miscellaneous

	SAL Reference	583339 001	583339 002	583339 003	583339 004
	Customer Sample Reference	BH2 D12 @ 6.00m	BH3 D9 @ 4.00m	BH02 D2 ES2 @ 1.00m	BH02 D6 ES5 @ 2.50m
	Date Sampled	06-JUN-2016	01-JUN-2016	06-JUN-2016	06-JUN-2016
Asbestos Quantification Stage 3	T413 / A40 / 0.001 / %	Amosite Detected Chrysotile Detected **0.38**	Amosite Detected Chrysotile Detected **0.005**	Anthophyllite **0.012**	Amosite Detected Chrysotile Detected **0.021**

Index to symbols used in 583339-1

Value	Description
A40	Assisted dried < 40C
S	Analysis was subcontracted
U	Analysis is UKAS accredited

Notes

Asbestos subcontracted to REC Limited

Method Index

Value	Description
T413	PLM/Grav

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Asbestos Quantification Stage 3	T413	A40	0.001	%	SU	001-004

SCIENTIFIC ANALYSIS LABORATORIES
DELIVERING SCIENCE

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Scientific Analysis Laboratories Ltd

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
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CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: Supplement 1A to Report Number 577812-1

Date of Report: 19-Aug-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001221
Customer Site Reference: Iberdrola
Date Job Received at SAL: 07-Jun-2016
Date Analysis Started: 22-Jun-2016
Date Analysis Completed: 30-Jun-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Chelsea Entwistle
Project Management

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

				SAL Reference	**577812 016**	**577812 018**	**577812 021**	**577812 022**	**577812 031**
				Customer Sample Reference	**TP01-TM @ 0.5m**	**TP01-TM @ 1.5m**	**TP02-TM @ 0.5m**	**TP02-TM @ 1.0m**	**TP03-TM @ 0.5m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**15**	**11**	**14**	**8**	**18**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	**0.3**	**0.2**	**0.3**	<0.1	**0.6**
Chromium	T257	A40	0.5	mg/kg	**18**	**8.6**	**13**	**10**	**38**
Copper	T257	A40	2	mg/kg	**37**	**29**	**25**	**9**	**94**
Lead	T257	A40	2	mg/kg	**150**	**74**	**170**	**11**	**180**
Mercury	T245	A40	1.0	mg/kg	<1.0	**1.8**	<1.0	<1.0	**2.1**
Nickel	T257	A40	0.5	mg/kg	**19**	**10**	**14**	**12**	**26**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**33**	**20**	**27**	**20**	**58**
Zinc	T257	A40	2	mg/kg	**140**	**92**	**130**	**33**	**200**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected
Chloride	T686	A40	2	mg/kg	**9**	**4**	**5**	**4**	**16**
pH	T7	A40			**8.0**	**8.2**	**8.2**	**8.0**	**7.6**
Soil Organic Matter	T287	A40	0.1	%	**2.4**	**0.5**	**1.5**	**0.3**	**3.0**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.01**	<0.01	<0.01	<0.01	**0.10**
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	**2.0**	<0.5	**1.2**	<0.5	**1.2**
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	<10	<10	**100**
Moisture @105C	T162	AR	0.1	%	**13**	**9.5**	**9.9**	**8.0**	**11**
Retained on 2mm	T2	A40	0.1	%	**13.4**	**17.6**	**32.5**	**21.7**	**10.8**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

				SAL Reference	**577812 032**	**577812 034**	**577812 040**	**577812 041**	**577812 043**
				Customer Sample Reference	**TP03-TM @ 1.0m**	**TP03-TM @ 2.0m**	**TP04-TM @ 0.5m**	**TP04-TM @ 1.0m**	**TP04-TM @ 2.0m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Fill**	**Topsoil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**21**	**160**	**16**	**15**	**13**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	**0.6**	**1.1**	**0.2**	**0.6**	**0.8**
Chromium	T257	A40	0.5	mg/kg	**31**	**120**	**17**	**22**	**21**
Copper	T257	A40	2	mg/kg	**52**	**290**	**27**	**79**	**54**
Lead	T257	A40	2	mg/kg	**480**	**190**	**35**	**310**	**360**
Mercury	T245	A40	1.0	mg/kg	**1.3**	<1.0	<1.0	**1.0**	<1.0
Nickel	T257	A40	0.5	mg/kg	**20**	**39**	**18**	**17**	**23**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**33**	**32**	**25**	**30**	**26**
Zinc	T257	A40	2	mg/kg	**180**	**720**	**98**	**270**	**220**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected
Chloride	T686	A40	2	mg/kg	**16**	**18**	**10**	**17**	**13**
pH	T7	A40			**7.4**	**7.5**	**8.0**	**7.8**	**8.0**
Soil Organic Matter	T287	A40	0.1	%	**3.0**	**3.1**	**1.3**	**2.9**	**2.8**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.41**	**1.3**	**0.06**	**0.04**	**0.16**
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1	<1	**1**
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	**5.8**	**1.2**	**2.1**	<0.5	**0.7**
TPH (C10-C40)	T219	AR	10	mg/kg	<10	**290**	<10	**150**	**150**
Moisture @105C	T162	AR	0.1	%	**13**	**13**	**9.8**	**9.2**	**8.6**
Retained on 2mm	T2	A40	0.1	%	**7.3**	**2.3**	**8.7**	**10.1**	**19.5**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

				SAL Reference	**577812 049**	**577812 050**	**577812 052**	**577812 058**	**577812 059**
				Customer Sample Reference	**TP05-TM @ 0.5m**	**TP05-TM @ 1.0m**	**TP05-TM @ 2.0m**	**TP06-TM @ 0.5m**	**TP06-TM @ 1.0m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Clay**	**Fill**	**Clay**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**12**	**13**	**10**	**13**	**13**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	**0.2**	**0.3**	**0.1**	**0.7**	**0.1**
Chromium	T257	A40	0.5	mg/kg	**13**	**17**	**15**	**11**	**12**
Copper	T257	A40	2	mg/kg	**33**	**900**	**18**	**57**	**14**
Lead	T257	A40	2	mg/kg	**170**	**310**	**13**	**310**	**13**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**12**	**20**	**19**	**12**	**20**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**24**	**30**	**26**	**21**	**21**
Zinc	T257	A40	2	mg/kg	**200**	**120**	**42**	**99**	**44**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected
Chloride	T686	A40	2	mg/kg	**12**	**17**	**12**	**15**	**13**
pH	T7	A40			**8.1**	**7.9**	**7.9**	**8.4**	**8.4**
Soil Organic Matter	T287	A40	0.1	%	**1.4**	**1.2**	**0.4**	**3.1**	**1.2**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.01**	**0.62**	**0.44**	**0.01**	<0.01
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	**1.1**	<0.5	**2.6**	**0.9**	<0.5
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	<10	<10	<10
Moisture @105C	T162	AR	0.1	%	**9.7**	**16**	**14**	**11**	**11**
Retained on 2mm	T2	A40	0.1	%	**14.5**	**27.2**	**49.0**	**16.5**	**31.4**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

					SAL Reference	**577812 082**	**577812 086**
					Customer Sample Reference	**BH01-TM @ 1.00m**	**BH01-TM @ 2.50m**
					Date Sampled	**07-JUN-2016**	**07-JUN-2016**
					Type	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Arsenic	T257	A40	2	mg/kg	**7**	**7**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1
Cadmium	T257	A40	0.1	mg/kg	**0.1**	<0.1
Chromium	T257	A40	0.5	mg/kg	**11**	**11**
Copper	T257	A40	2	mg/kg	**27**	**8**
Lead	T257	A40	2	mg/kg	**26**	**12**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**12**	**12**
Selenium	T257	A40	3	mg/kg	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**19**	**20**
Zinc	T257	A40	2	mg/kg	**44**	**37**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected
Chloride	T686	A40	2	mg/kg	**11**	**10**
pH	T7	A40			**7.9**	**7.5**
Soil Organic Matter	T287	A40	0.1	%	**0.3**	**0.4**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.03**	<0.01
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	<0.5	<0.5
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10
Moisture @105C	T162	AR	0.1	%	**11**	**13**
Retained on 2mm	T2	A40	0.1	%	**14.2**	**8.0**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

					SAL Reference	**577812 016**	**577812 018**	**577812 021**	**577812 022**	**577812 031**
					Customer Sample Reference	**TP01-TM @ 0.5m**	**TP01-TM @ 1.5m**	**TP02-TM @ 0.5m**	**TP02-TM @ 1.0m**	**TP03-TM @ 0.5m**
					Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**
					Type	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Naphthalene	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	**1.2**	**1.1**	<0.1	<0.1	**0.5**
Anthracene	T16	AR	0.1	mg/kg	**0.2**	**0.3**	<0.1	<0.1	**0.1**
Fluoranthene	T16	AR	0.1	mg/kg	**2.6**	**2.9**	**0.3**	<0.1	**1.3**
Pyrene	T16	AR	0.1	mg/kg	**2.5**	**2.4**	**0.3**	<0.1	**1.2**
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	**1.5**	**1.3**	**0.2**	<0.1	**0.7**
Chrysene	T16	AR	0.1	mg/kg	**1.8**	**1.4**	**0.2**	<0.1	**0.8**
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	**1.6**	**1.3**	**0.2**	<0.1	**0.7**
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	**1.6**	**1.1**	**0.2**	<0.1	**0.8**
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	**1.8**	**1.3**	**0.2**	<0.1	**0.9**
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	**1.0**	**0.8**	<0.1	<0.1	**0.5**
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	**0.4**	**0.3**	<0.1	<0.1	**0.2**
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	**1.1**	**0.8**	**0.1**	<0.1	**0.6**
PAH(total)	T16	AR	0.1	mg/kg	**18**	**15**	**1.5**	<0.1	**8.3**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**577812 032**	**577812 034**	**577812 040**	**577812 041**	**577812 043**
				Customer Sample Reference	**TP03-TM @ 1.0m**	**TP03-TM @ 2.0m**	**TP04-TM @ 0.5m**	**TP04-TM @ 1.0m**	**TP04-TM @ 2.0m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Fill**	**Topsoil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	**0.4**	**0.1**	**0.1**	**0.7**	**0.4**
Anthracene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.2**	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	**0.9**	**0.4**	**0.4**	**1.7**	**1.1**
Pyrene	T16	AR	0.1	mg/kg	**0.8**	**0.4**	**0.4**	**1.5**	**1.0**
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	**0.5**	**0.4**	**0.2**	**1.0**	**0.6**
Chrysene	T16	AR	0.1	mg/kg	**0.6**	**0.4**	**0.2**	**1.1**	**0.7**
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	**0.6**	**0.4**	**0.2**	**1.1**	**0.6**
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	**0.5**	**0.4**	**0.2**	**0.8**	**0.7**
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	**0.6**	**0.5**	**0.2**	**0.9**	**0.6**
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	**0.4**	**0.3**	**0.1**	**0.5**	**0.4**
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.2**	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	**0.4**	**0.4**	**0.1**	**0.6**	**0.4**
PAH(total)	T16	AR	0.1	mg/kg	**6.0**	**3.8**	**2.2**	**10**	**6.4**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**577812 049**	**577812 050**	**577812 052**	**577812 058**	**577812 059**
				Customer Sample Reference	**TP05-TM @ 0.5m**	**TP05-TM @ 1.0m**	**TP05-TM @ 2.0m**	**TP06-TM @ 0.5m**	**TP06-TM @ 1.0m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Clay**	**Fill**	**Clay**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.2**	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	**0.4**	**0.1**	<0.1	**0.8**	<0.1
Pyrene	T16	AR	0.1	mg/kg	**0.3**	**0.1**	<0.1	**0.8**	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.6**	<0.1
Chrysene	T16	AR	0.1	mg/kg	**0.3**	<0.1	<0.1	**0.6**	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.7**	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.6**	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.7**	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.3**	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.1**	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.3**	<0.1
PAH(total)	T16	AR	0.1	mg/kg	**2.2**	**0.2**	<0.1	**5.6**	<0.1

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil

Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**577812 082**	**577812 086**
				Customer Sample Reference	**BH01-TM @ 1.00m**	**BH01-TM @ 2.50m**
				Date Sampled	**07-JUN-2016**	**07-JUN-2016**
				Type	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil

TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**577812 016**	**577812 018**	**577812 021**	**577812 022**	**577812 031**
				Customer Sample Reference	**TP01-TM @ 0.5m**	**TP01-TM @ 1.5m**	**TP02-TM @ 0.5m**	**TP02-TM @ 1.0m**	**TP03-TM @ 0.5m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**06-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**4**
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**2**
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**3**
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**5**
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**31**
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	**19**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**577812 032**	**577812 034**	**577812 040**	**577812 041**	**577812 043**
				Customer Sample Reference	**TP03-TM @ 1.0m**	**TP03-TM @ 2.0m**	**TP04-TM @ 0.5m**	**TP04-TM @ 1.0m**	**TP04-TM @ 2.0m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Fill**	**Topsoil**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	**210**	<2	<2	**69**
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	**64**	<2	**110**	**70**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**577812 049**	**577812 050**	**577812 052**	**577812 058**	**577812 059**
				Customer Sample Reference	**TP05-TM @ 0.5m**	**TP05-TM @ 1.0m**	**TP05-TM @ 2.0m**	**TP06-TM @ 0.5m**	**TP06-TM @ 1.0m**
				Date Sampled	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Clay**	**Fill**	**Clay**	**Fill**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

SAL Reference	**577812 082**	**577812 086**
Customer Sample Reference	**BH01-TM @ 1.00m**	**BH01-TM @ 2.50m**
Date Sampled	**07-JUN-2016**	**07-JUN-2016**
Type	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units		
Benzene	T209	AR	10	µg/kg	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
VOC (SE)

				SAL Reference	**577812 018**	**577812 032**	**577812 041**	**577812 050**
				Customer Sample Reference	**TP01-TM @ 1.5m**	**TP03-TM @ 1.0m**	**TP04-TM @ 1.0m**	**TP05-TM @ 1.0m**
				Date Sampled	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Sandy Soil**	**Topsoil**	**Fill**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5
n-Butylbenzene	T54	AR	10	µg/kg	<10	<10	<10	<10
Vinyl chloride	T54	AR	10	µg/kg	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50
1,1-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	<10	<10	<10	<10
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
1,4-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
Chlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5
Trichlorofluoromethane	T54	AR	5	µg/kg	<5	<5	<5	<5
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10
1,1-Dichloroethylene	T54	AR	5	µg/kg	<5	<5	<5	<5
1,2-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
1,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5
Bromobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
S-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50
1,2-dibromoethane	T209	AR	50	µg/kg	<50	<50	<50	<50
Carbon tetrachloride	T54	AR	5	µg/kg	<5	<5	<5	<5
Chloroform	T54	AR	5	µg/kg	<5	<5	<5	<5
Dichlorodifluoromethane	T209	AR	50	µg/kg	<50	<50	<50	<50
m/p ethyl toluene	T54	AR	5	µg/kg	<5	<5	<5	<5
p-Isopropyltoluene	T54	AR	5	µg/kg	<5	<5	<5	<5
Styrene	T54	AR	50	µg/kg	<50	<50	<50	<50
1,3-Dichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
4-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5
Bromoform	T209	AR	50	µg/kg	<50	<50	<50	<50
Chloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50
Isopropyl benzene	T54	AR	50	µg/kg	<50	<50	<50	<50
n-Propylbenzene	T54	AR	50	µg/kg	<50	<50	<50	<50
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	**14**	<5
1,3-Dichloropropane	T209	AR	50	µg/kg	<50	<50	<50	<50
2,2-Dichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5
Dibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5
Hexachlorobutadiene	T209	AR	10	µg/kg	<10	<10	<10	<10
Tetrachloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5
Trichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	<50	<50	<50	<50
1,1,2-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5
1,2,3-Trichloropropane	T54	AR	5	µg/kg	<5	<5	<5	<5
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
1,2-Dichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5
Bromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5
Chloromethane	T209	AR	50	µg/kg	<50	<50	<50	<50
Tertiary amyl methyl ether	T54	AR	5	µg/kg	<5	<5	<5	<5
1,1,1-Trichloroethane	T54	AR	5	µg/kg	<5	<5	<5	<5
1,1-Dichloropropene	T54	AR	5	µg/kg	<5	<5	<5	<5
2-Chlorotoluene	T54	AR	5	µg/kg	<5	<5	<5	<5
Bromochloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5
Bromodichloromethane	T54	AR	5	µg/kg	<5	<5	<5	<5
Chlorodibromomethane	T54	AR	5	µg/kg	<5	<5	<5	<5

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
VOC (SE)

SAL Reference	**577812 018**	**577812 032**	**577812 041**	**577812 050**
Customer Sample Reference	**TP01-TM @ 1.5m**	**TP03-TM @ 1.0m**	**TP04-TM @ 1.0m**	**TP05-TM @ 1.0m**
Date Sampled	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
Type	**Sandy Soil**	**Topsoil**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units				
T-Butylbenzene	T54	AR	5	µg/kg	<5	<5	<5	<5
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	<5	<5	<5	<5

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Leachate Suite

SAL Reference	**577812 056**	**577812 086**
Customer Sample Reference	**TP06-CH @ 2.0m**	**BH01-TM @ 2.50m**
Date Sampled	**02-JUN-2016**	**07-JUN-2016**
Type	**Sandy Soil**	**Clay**

Determinand	Method	Test Sample	LOD	Units		
As (Dissolved)	T281	10:1	0.0002	mg/l	**0.0037**	<0.0002
B (Dissolved)	T281	10:1	0.05	mg/l	<0.05	<0.05
Cd (Dissolved)	T281	10:1	0.00002	mg/l	**0.00003**	<0.00002
Cr (Dissolved)	T281	10:1	0.001	mg/l	**0.004**	<0.001
Cu (Dissolved)	T281	10:1	0.0005	mg/l	**0.0014**	**0.0011**
Pb (Dissolved)	T281	10:1	0.0003	mg/l	**0.0013**	**0.0008**
Hg (Dissolved)	T281	10:1	0.00005	mg/l	<0.00005	<0.00005
Ni (Dissolved)	T281	10:1	0.001	mg/l	**0.001**	<0.001
Se (Dissolved)	T281	10:1	0.0005	mg/l	<0.0005	<0.0005
Zn (Dissolved)	T281	10:1	0.002	mg/l	**0.006**	**0.007**
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	**0.11**	**0.23**
Cyanide(Total)	T546	10:1	0.01	mg/l	<0.01	<0.01
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	**2**	**1**
pH	T7	10:1			**7.1**	**7.0**
Chemical Oxygen Demand	T221	10:1	20	mg/l	**27**	**28**
Chloride	T686	10:1	1	mg/l	**2**	**3**
Nitrate	T686	10:1	0.5	mg/l	**1.0**	**1.3**
Nitrite	T686	10:1	0.1	mg/l	<0.1	<0.1
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	<10	<10
Phenols(Mono)	T546	10:1	0.02	mg/l	<0.02	<0.02
Sulphate	T686	10:1	0.5	mg/l	**0.5**	**1.5**
TPH (C10-C40)	T219	10:1	20	µg/l	**150**	**180**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Total and Speciated USEPA16 PAH (SE)

SAL Reference	**577812 086**
Customer Sample Reference	**BH01-TM @ 2.50m**
Date Sampled	**07-JUN-2016**
Type	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T149	10:1	0.01	µg/l	**0.03**
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01
Acenaphthene	T149	10:1	0.01	µg/l	<0.01
Fluorene	T149	10:1	0.01	µg/l	<0.01
Phenanthrene	T149	10:1	0.01	µg/l	**0.06**
Anthracene	T149	10:1	0.01	µg/l	<0.01
Fluoranthene	T149	10:1	0.01	µg/l	**0.02**
Pyrene	T149	10:1	0.01	µg/l	<0.01
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01
Chrysene	T149	10:1	0.01	µg/l	<0.01
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	<0.01
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	<0.01
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	<0.01
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01
PAH(total)	T149	10:1	0.01	µg/l	**0.11**

Index to symbols used in Supplement 1A to Report Number 577812-1

Value	Description
10:1	Leachate
A40	Assisted dried < 40C
AR	As Received
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Limited
Retained on 2mm is removed before analysis
Reported results on as received samples are corrected to a 105 degree centigrade dry weight basis except Ammonia & TPH c5-c35 aromatic/aliphatic split
050 - Samples submitted for GC/MS (Headspace) analysis were submitted in inappropriate containers. It is possible therefore that the results provided may be compromised.
Supplement 1A - Report reissued to omit TP01-CH, TP03-CH, TP04-CH, TP06-CH, TP08-CH and TP10-CH
Phenol, PAHs, TPH c10-c40 and VOCs - These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T221	Colorimetry (CE)
T921	Colorimetry (CF) (MCERT)
T245	ICP/OES (Aqua Regia Extraction)
T4	Colorimetry
T21	OX/IR
T219	GC/FID (SE)
T264	Probe (Incubation Carbonaceous) (5 Days)
T54	GC/MS (Headspace)
T149	GC/MS (SIR)
T546	Colorimetry (CF)
T808	Calc (by EC)
T27	PLM
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T82	ICP/OES (Sim)
T281	ICP/MS (Filtered)

T7	Probe
T209	GC/MS (Head Space)(MCERTS)
T649	ICP/OES (Calc)
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T2	Grav
T16	GC/MS
T162	Grav (1 Dec) (105 C)
T287	Calc TOC/0.58
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Arsenic	T257	A40	2	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Arsenic	T257	A40	2.0	mg/kg	U	034,041,050,058
Boron (water-soluble)	T82	A40	1	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Cadmium	T257	A40	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Cadmium	T257	A40	0.1	mg/kg	U	034,041,050,058
Chromium	T257	A40	0.5	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Chromium	T257	A40	0.5	mg/kg	U	034,041,050,058
Copper	T257	A40	2	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Copper	T257	A40	2	mg/kg	U	034,041,050,058
Lead	T257	A40	2	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Lead	T257	A40	2	mg/kg	U	034,041,050,058
Mercury	T245	A40	1.0	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Nickel	T257	A40	0.5	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Nickel	T257	A40	0.5	mg/kg	U	034,041,050,058
Selenium	T257	A40	3	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Vanadium	T257	A40	0.1	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Zinc	T257	A40	2	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Zinc	T257	A40	2	mg/kg	U	034,041,050,058
Asbestos ID	T27	A40			SU	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Chloride	T686	A40	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
pH	T7	A40			M	016,018,021-022,031-032,040,043,049,052,059,082,086
pH	T7	A40			U	034,041,050,058
Soil Organic Matter	T287	A40	0.1	%	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	M	016,018,021-022,031-032,040,043,049,052,059,082,086
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	U	034,041,050,058
Cyanide(Total)	T921	AR	1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Cyanide(Total)	T921	AR	1	mg/kg	U	034,041,050,058
Cyanide(free)	T921	AR	1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Cyanide(free)	T921	AR	1	mg/kg	U	034,041,050,058
Phenols(Mono)	T921	AR	1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Phenols(Mono)	T921	AR	1	mg/kg	U	034,041,050,058
Ammonia expressed as NH4	T4	AR	0.5	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C10-C40)	T219	AR	10	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
TPH (C10-C40)	T219	AR	10	mg/kg	U	034,041,050,058
Moisture @105C	T162	AR	0.1	%	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Retained on 2mm	T2	A40	0.1	%	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Naphthalene	T16	AR	0.1	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Acenaphthylene	T16	AR	0.1	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Acenaphthene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Acenaphthene	T16	AR	0.1	mg/kg	U	034,041,050,058
Fluorene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Fluorene	T16	AR	0.1	mg/kg	U	034,041,050,058
Phenanthrene	T16	AR	0.1	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Anthracene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Anthracene	T16	AR	0.1	mg/kg	U	034,041,050,058
Fluoranthene	T16	AR	0.1	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Pyrene	T16	AR	0.1	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	U	034,041,050,058
Chrysene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Chrysene	T16	AR	0.1	mg/kg	U	034,041,050,058
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	U	034,041,050,058
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	U	034,041,050,058

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	U	034,041,050,058
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	U	034,041,050,058
PAH(total)	T16	AR	0.1	mg/kg	U	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
Benzene	T209	AR	10	µg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Benzene	T209	AR	10	µg/kg	U	034,041,050,058
EthylBenzene	T209	AR	10	µg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
EthylBenzene	T209	AR	10	µg/kg	U	034,041,050,058
M/P Xylene	T209	AR	10	µg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
M/P Xylene	T209	AR	10	µg/kg	U	034,041,050,058
O Xylene	T209	AR	10	µg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
O Xylene	T209	AR	10	µg/kg	U	034,041,050,058
Toluene	T209	AR	10	µg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Toluene	T209	AR	10	µg/kg	U	034,041,050,058
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	M	016,018,021-022,031-032,040,043,049,052,059,082,086
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	U	034,041,050,058
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	N	016,018,021-022,031-032,034,040-041,043,049-050,052,058-059,082,086
1,1,1,2-Tetrachloroethane	T209	AR	50	µg/kg	U	018,032,041,050
1,1,1-Trichloroethane	T54	AR	5	µg/kg	M	018,032
1,1,1-Trichloroethane	T54	AR	5	µg/kg	U	041,050
1,1,2,2-Tetrachloroethane	T209	AR	50	µg/kg	U	018,032,041,050
1,1,2-Trichloroethane	T54	AR	5	µg/kg	U	018,032,041,050
1,1-Dichloroethane	T54	AR	5	µg/kg	M	018,032
1,1-Dichloroethane	T54	AR	5	µg/kg	U	041,050
1,1-Dichloroethylene	T54	AR	5	µg/kg	M	018,032
1,1-Dichloroethylene	T54	AR	5	µg/kg	U	041,050
1,1-Dichloropropene	T54	AR	5	µg/kg	M	018,032
1,1-Dichloropropene	T54	AR	5	µg/kg	U	041,050
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	M	018,032
1,2,3-Trichlorobenzene	T54	AR	5	µg/kg	U	041,050
1,2,3-Trichloropropane	T54	AR	5	µg/kg	U	018,032,041,050
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	M	018,032
1,2,4-Trichlorobenzene	T54	AR	5	µg/kg	U	041,050
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	M	018,032
1,2,4-Trimethylbenzene	T54	AR	50	µg/kg	U	041,050
1,2-Dibromo-3-Chloropropane	T54	AR	10	µg/kg	U	018,032,041,050
1,2-Dichlorobenzene	T54	AR	5	µg/kg	M	018,032
1,2-Dichlorobenzene	T54	AR	5	µg/kg	U	041,050
1,2-Dichloroethane	T54	AR	5	µg/kg	M	018,032
1,2-Dichloroethane	T54	AR	5	µg/kg	U	041,050
1,2-Dichloropropane	T54	AR	5	µg/kg	M	018,032
1,2-Dichloropropane	T54	AR	5	µg/kg	U	041,050
1,2-dibromoethane	T209	AR	50	µg/kg	U	018,032,041,050
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	M	018,032
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	U	041,050
1,3-Dichlorobenzene	T54	AR	5	µg/kg	M	018,032
1,3-Dichlorobenzene	T54	AR	5	µg/kg	U	041,050
1,3-Dichloropropane	T209	AR	50	µg/kg	U	018,032,041,050
1,4-Dichlorobenzene	T54	AR	5	µg/kg	M	018,032
1,4-Dichlorobenzene	T54	AR	5	µg/kg	U	041,050
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	M	018,032
Ethyl-2-Methylbenzene	T54	AR	5	µg/kg	U	041,050
2,2-Dichloropropane	T54	AR	5	µg/kg	M	018,032
2,2-Dichloropropane	T54	AR	5	µg/kg	U	041,050
2-Chlorotoluene	T54	AR	5	µg/kg	M	018,032
2-Chlorotoluene	T54	AR	5	µg/kg	U	041,050

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
4-Chlorotoluene	T54	AR	5	µg/kg	M	018,032
4-Chlorotoluene	T54	AR	5	µg/kg	U	041,050
Bromobenzene	T54	AR	5	µg/kg	M	018,032
Bromobenzene	T54	AR	5	µg/kg	U	041,050
Bromochloromethane	T54	AR	5	µg/kg	M	018,032
Bromochloromethane	T54	AR	5	µg/kg	U	041,050
Bromodichloromethane	T54	AR	5	µg/kg	M	018,032
Bromodichloromethane	T54	AR	5	µg/kg	U	041,050
Bromoform	T209	AR	50	µg/kg	U	018,032,041,050
Bromomethane	T54	AR	5	µg/kg	U	018,032,041,050
Carbon tetrachloride	T54	AR	5	µg/kg	M	018,032
Carbon tetrachloride	T54	AR	5	µg/kg	U	041,050
Chlorobenzene	T54	AR	5	µg/kg	M	018,032
Chlorobenzene	T54	AR	5	µg/kg	U	041,050
Chlorodibromomethane	T54	AR	5	µg/kg	M	018,032
Chlorodibromomethane	T54	AR	5	µg/kg	U	041,050
Chloroethane	T209	AR	50	µg/kg	U	018,032,041,050
Chloroform	T54	AR	5	µg/kg	M	018,032
Chloroform	T54	AR	5	µg/kg	U	041,050
Chloromethane	T209	AR	50	µg/kg	N	018,032,041,050
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	M	018,032
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	U	041,050
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	M	018,032
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	U	041,050
Dibromomethane	T54	AR	5	µg/kg	M	018,032
Dibromomethane	T54	AR	5	µg/kg	U	041,050
Dichlorodifluoromethane	T209	AR	50	µg/kg	N	018,032,041,050
Hexachlorobutadiene	T209	AR	10	µg/kg	U	018,032,041,050
Isopropyl benzene	T54	AR	50	µg/kg	M	018,032
Isopropyl benzene	T54	AR	50	µg/kg	U	041,050
S-Butylbenzene	T54	AR	5	µg/kg	M	018,032
S-Butylbenzene	T54	AR	5	µg/kg	U	041,050
Styrene	T54	AR	50	µg/kg	M	018,032
Styrene	T54	AR	50	µg/kg	U	041,050
T-Butylbenzene	T54	AR	5	µg/kg	M	018,032
T-Butylbenzene	T54	AR	5	µg/kg	U	041,050
Tertiary amyl methyl ether	T54	AR	5	µg/kg	M	018,032
Tertiary amyl methyl ether	T54	AR	5	µg/kg	U	041,050
Tetrachloroethene	T54	AR	5	µg/kg	M	018,032
Tetrachloroethene	T54	AR	5	µg/kg	U	041,050
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	M	018,032
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	U	041,050
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	M	018,032
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	U	041,050
Trichloroethene	T54	AR	5	µg/kg	M	018,032
Trichloroethene	T54	AR	5	µg/kg	U	041,050
Trichlorofluoromethane	T54	AR	5	µg/kg	M	018,032
Trichlorofluoromethane	T54	AR	5	µg/kg	U	041,050
Vinyl chloride	T54	AR	10	µg/kg	M	018,032
Vinyl chloride	T54	AR	10	µg/kg	U	041,050
m/p ethyl toluene	T54	AR	5	µg/kg	M	018,032
m/p ethyl toluene	T54	AR	5	µg/kg	U	041,050
n-Butylbenzene	T54	AR	10	µg/kg	U	018,032,041,050
n-Propylbenzene	T54	AR	50	µg/kg	M	018,032
n-Propylbenzene	T54	AR	50	µg/kg	U	041,050
p-Isopropyltoluene	T54	AR	5	µg/kg	M	018,032
p-Isopropyltoluene	T54	AR	5	µg/kg	U	041,050
As (Dissolved)	T281	10:1	0.0002	mg/l	U	056,086
B (Dissolved)	T281	10:1	0.05	mg/l	U	056,086
Cd (Dissolved)	T281	10:1	0.00002	mg/l	U	056,086
Cr (Dissolved)	T281	10:1	0.001	mg/l	U	056,086
Cu (Dissolved)	T281	10:1	0.0005	mg/l	U	056,086
Pb (Dissolved)	T281	10:1	0.0003	mg/l	U	056,086
Hg (Dissolved)	T281	10:1	0.00005	mg/l	U	056,086
Ni (Dissolved)	T281	10:1	0.001	mg/l	U	056,086
Se (Dissolved)	T281	10:1	0.0005	mg/l	U	056,086
Zn (Dissolved)	T281	10:1	0.002	mg/l	U	056,086
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	U	056,086
Cyanide(Total)	T546	10:1	0.01	mg/l	U	056,086
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	N	056,086

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Chemical Oxygen Demand	T221	10:1	20	mg/l	N	056,086
pH	T7	10:1			N	056,086
Chloride	T686	10:1	1	mg/l	U	056,086
Nitrate	T686	10:1	0.5	mg/l	U	056,086
Nitrite	T686	10:1	0.1	mg/l	U	056,086
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	U	056,086
Phenols(Mono)	T546	10:1	0.02	mg/l	U	056,086
Sulphate	T686	10:1	0.5	mg/l	U	056,086
TPH (C10-C40)	T219	10:1	20	µg/l	N	056,086
Naphthalene	T149	10:1	0.01	µg/l	N	086
Acenaphthylene	T149	10:1	0.01	µg/l	N	086
Acenaphthene	T149	10:1	0.01	µg/l	N	086
Fluorene	T149	10:1	0.01	µg/l	N	086
Phenanthrene	T149	10:1	0.01	µg/l	N	086
Anthracene	T149	10:1	0.01	µg/l	N	086
Fluoranthene	T149	10:1	0.01	µg/l	N	086
Pyrene	T149	10:1	0.01	µg/l	N	086
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	N	086
Chrysene	T149	10:1	0.01	µg/l	N	086
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	N	086
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	N	086
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	N	086
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	N	086
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	N	086
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	N	086
PAH(total)	T149	10:1	0.01	µg/l	N	086

REC
DELIVERING SOLUTIONS

East Kilbride
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East Kilbride, G75 0YF
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UKAS TESTING
2520

Certificate of Analysis for Quantification of Asbestos in Soil / Aggregate

Job No 16EK- B4784

Customer Address

SAL Ltd
Springwood Industrial Estate
Braintree, Essex
CM7 2RT

Site Address

583339

Customer Order No	583339
Samples Submitted By	Client
Sampled By	Client
No. of Samples Submitted	4
Date Samples Submitted	08/07/2016
Date Samples Analysed	13/07/2016
Samples Analysed In	East Kilbride
Samples Analysed By	Tom Howat
Stage 3 Slides Analysed By	Tom Howat
Analyst / Authorised Signatures	Tom Howat

REC Asbestos accepts no responsibility for sampling activities undertaken by the client. Analysis is conducted in accordance with HSG 248 and documented in house procedures for soil analysis and quantification. Where soil analysis requires the taking of representative sub samples, the cone and quarter technique is used as described in Bulk Analysis Procedures. The material description shall be regarded as tentative and is not included in the UKAS Accreditation for this laboratory. Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation. NAD = No Asbestos Detected. Where this document has been digitally signed, printed copies are uncontrolled. Uncertainty of measurement has been calculated in line with current available reference data . Uncertainty of measurement may increase with samples of clay soil type and loose chrysotile. AC = Asbestos Cement. AIB = Asbestos Insulation Board. The contribution of fine fibres analysed at Stage 3 can be up to 0.050%. Where a positive result at Stage 2 is reported but Stage 3 analysis is not requested, clients are advised that the Stage 3 contribution could take the overall concentration above the point of interest

Sample No	Origin / Location of Material / Depth	Material Type	ACMs Identified	Asbestos Type(s) Identified	Overall Mass Percentage of Asbestos	Comments	Level of Analysis Conducted
1	001	Soil	Loose Fibre	Amosite Chrysotile	0.375		Stage 3
2	002	Soil	AC Loose Fibre	Chrysotile Amosite	0.005		Stage 3
3	003	Soil	Loose Fibre	Anthophyllite	0.012		Stage 3
4	004	Soil	AIB Bitumen	Amosite Chrysotile	0.021		Stage 3

SCIENTIFIC ANALYSIS LABORATORIES
DELIVERING SCIENCE

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Scientific Analysis Laboratories Ltd

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: 577812-1 A

Date of Report: 30-Jun-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001221
Customer Site Reference: Iberdrola
Date Job Received at SAL: 07-Jun-2016
Date Analysis Started: 22-Jun-2016
Date Analysis Completed: 30-Jun-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Claire Brown Crociquia
Customer Service Manager

Waste Acceptance Criteria

Customer Sample Reference : TP01-TM @ 0.5m
SAL Sample Reference : 577812 016
Project Site : Iberdrola
Customer Reference : 1CO101165
Date Sampled : 06-JUN-2016
Type : Topsoil

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			M	**8.0**		> 6.0	
Loss on Ignition	Ign @450C/Grav	0.1	%	M	**3.8**			10.0
Total Organic Carbon	OX/IR	0.1	%	N	**1.4**	3.0	5.0	6.0
Mineral Oil	GC/FID (SE)	10	mg/kg	N	<10			
Moisture	Grav (1 Dec) (105 C)	0.1	%	N	**13**			
Retained on 2mm Sieve	Grav	0.1	%	N	**13.4**			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	**0.033**	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	**0.015**	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.17**	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	**0.00058**	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	<10	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.054**	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	**70**	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	**9.6**	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	**0.013**	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	**0.19**	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	**0.013**	0.4	10.0	40.0
Phenols (Total-Mono)	Calc (W)	0.20	mg/kg	N	<0.20	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate ion	Calc (W)	5	mg/kg	N	**14**	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	**740**	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	**0.073**	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

*** Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013**

Waste Acceptance Criteria

Customer Sample Reference : TP03-TM @ 1.0m
SAL Sample Reference : 577812 032
Project Site : Iberdrola
Customer Reference : 1CO101165
Date Sampled : 01-JUN-2016
Type : Topsoil

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			M	**7.4**		> 6.0	
Loss on Ignition	Ign @450C/Grav	0.1	%	M	**3.9**			10.0
Total Organic Carbon	OX/IR	0.1	%	N	**1.7**	3.0	5.0	6.0
Mineral Oil	GC/FID (SE)	10	mg/kg	N	<10			
Moisture	Grav (1 Dec) (105 C)	0.1	%	N	**13**			
Retained on 2mm Sieve	Grav	0.1	%	N	**7.3**			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	**0.045**	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	**0.092**	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.074**	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	**0.00037**	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	<10	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.015**	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.066**	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	**60**	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	**13**	**10.0**	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	**0.0039**	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	**0.091**	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	**0.024**	0.4	10.0	40.0
Phenols (Total-Mono)	Calc (W)	0.20	mg/kg	N	<0.20	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate ion	Calc (W)	5	mg/kg	N	**820**	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	**2000**	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	**0.074**	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

*** Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013**

Waste Acceptance Criteria

Customer Sample Reference : TP04-TM @ 0.5m
SAL Sample Reference : 577812 040
Project Site : Iberdrola
Customer Reference : 1CO101165
Date Sampled : 01-JUN-2016
Type : Topsoil

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			M	**8.0**		> 6.0	
Loss on Ignition	Ign @450C/Grav	0.1	%	M	**2.2**			10.0
Total Organic Carbon	OX/IR	0.1	%	N	**0.7**	3.0	5.0	6.0
Mineral Oil	GC/FID (SE)	10	mg/kg	N	<10			
Moisture	Grav (1 Dec) (105 C)	0.1	%	N	**9.8**			
Retained on 2mm Sieve	Grav	0.1	%	N	**8.7**			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	**0.022**	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	**0.018**	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.16**	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	**0.00050**	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	<10	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.010**	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.040**	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	**60**	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	**24**	**10.0**	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	**0.0040**	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	**0.050**	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	**0.014**	0.4	10.0	40.0
Phenols (Total-Mono)	Calc (W)	0.20	mg/kg	N	<0.20	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate ion	Calc (W)	5	mg/kg	N	<5	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	**740**	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	**0.056**	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

*** Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013**

Waste Acceptance Criteria

Customer Sample Reference : TP05-TM @ 0.5m
SAL Sample Reference : 577812 049
Project Site : Iberdrola
Customer Reference : 1CO101165
Date Sampled : 01-JUN-2016
Type : Clay

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			M	**8.1**		> 6.0	
Loss on Ignition	Ign @450C/Grav	0.1	%	M	**2.2**			10.0
Total Organic Carbon	OX/IR	0.1	%	N	**0.8**	3.0	5.0	6.0
Mineral Oil	GC/FID (SE)	10	mg/kg	N	<10			
Moisture	Grav (1 Dec) (105 C)	0.1	%	N	**9.7**			
Retained on 2mm Sieve	Grav	0.1	%	N	**14.5**			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	**0.070**	**0.06**	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	**0.046**	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.18**	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	**0.00031**	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	**17**	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.43**	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.097**	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	**70**	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	**8.1**	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	**0.13**	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	**0.047**	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	**0.013**	0.4	10.0	40.0
Phenols (Total-Mono)	Calc (W)	0.20	mg/kg	N	<0.20	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate ion	Calc (W)	5	mg/kg	N	**48**	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	**800**	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	**0.23**	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

*** Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013**

Waste Acceptance Criteria

Customer Sample Reference : TP05-TM @ 1.0m
SAL Sample Reference : 577812 050
Project Site : Iberdrola
Customer Reference : 1CO101165
Date Sampled : 01-JUN-2016
Type : Fill

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			U	**7.9**		> 6.0	
Loss on Ignition	Ign @450C/Grav	0.1	%	U	**2.1**			10.0
Total Organic Carbon	OX/IR	0.1	%	N	**0.7**	3.0	5.0	6.0
Mineral Oil	GC/FID (SE)	10	mg/kg	N	<10			
Moisture	Grav (1 Dec) (105 C)	0.1	%	N	**16**			
Retained on 2mm Sieve	Grav	0.1	%	N	**27.2**			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	**0.24**	**0.06**	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	**0.019**	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.30**	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	**0.00065**	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	**14**	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.078**	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.056**	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	**60**	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	**9.4**	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	**0.089**	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	**0.00057**	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	**0.16**	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	**0.017**	0.4	10.0	40.0
Phenols (Total-Mono)	Calc (W)	0.20	mg/kg	N	<0.20	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate ion	Calc (W)	5	mg/kg	N	**850**	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	**1900**	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	**0.23**	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

*** Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
BTEX

				SAL Reference	**577812 016**	**577812 032**	**577812 040**	**577812 049**	**577812 050**
				Customer Sample Reference	**TP01-TM @ 0.5m**	**TP03-TM @ 1.0m**	**TP04-TM @ 0.5m**	**TP05-TM @ 0.5m**	**TP05-TM @ 1.0m**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Date Sampled	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**	**Fill**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Benzene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10	<10	-
Benzene	GC/MS (Head Space)(MCERTS)	10	µg/kg	U	-	-	-	-	<10
EthylBenzene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10	<10	-
EthylBenzene	GC/MS (Head Space)(MCERTS)	10	µg/kg	U	-	-	-	-	<10
Meta/Para-Xylene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10	<10	-
Meta/Para-Xylene	GC/MS (Head Space)(MCERTS)	10	µg/kg	U	-	-	-	-	<10
Ortho-Xylene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10	<10	-
Ortho-Xylene	GC/MS (Head Space)(MCERTS)	10	µg/kg	U	-	-	-	-	<10
Toluene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10	<10	-
Toluene	GC/MS (Head Space)(MCERTS)	10	µg/kg	U	-	-	-	-	<10

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**577812 016**	**577812 032**	**577812 040**	**577812 049**	**577812 050**
				Customer Sample Reference	**TP01-TM @ 0.5m**	**TP03-TM @ 1.0m**	**TP04-TM @ 0.5m**	**TP05-TM @ 0.5m**	**TP05-TM @ 1.0m**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Date Sampled	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**	**Fill**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Naphthalene	GC/MS	0.1	mg/kg	U	**0.2**	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	GC/MS	0.1	mg/kg	U	**0.1**	<0.1	<0.1	<0.1	<0.1
Acenaphthene	GC/MS	0.1	mg/kg	M	<0.1	<0.1	<0.1	<0.1	-
Acenaphthene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Fluorene	GC/MS	0.1	mg/kg	M	<0.1	<0.1	<0.1	<0.1	-
Fluorene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Phenanthrene	GC/MS	0.1	mg/kg	U	**1.2**	**0.4**	**0.1**	**0.2**	<0.1
Anthracene	GC/MS	0.1	mg/kg	M	**0.2**	**0.1**	<0.1	<0.1	-
Anthracene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Fluoranthene	GC/MS	0.1	mg/kg	N	**2.6**	**0.9**	**0.4**	**0.4**	**0.1**
Pyrene	GC/MS	0.1	mg/kg	N	**2.5**	**0.8**	**0.4**	**0.3**	**0.1**
Benzo(a)Anthracene	GC/MS	0.1	mg/kg	M	**1.5**	**0.5**	**0.2**	**0.2**	-
Benzo(a)Anthracene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Chrysene	GC/MS	0.1	mg/kg	M	**1.8**	**0.6**	**0.2**	**0.3**	-
Chrysene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Benzo(b)fluoranthene	GC/MS	0.1	mg/kg	U	**1.6**	**0.6**	**0.2**	**0.2**	<0.1
Benzo(k)fluoranthene	GC/MS	0.1	mg/kg	N	**1.6**	**0.5**	**0.2**	**0.2**	<0.1
Benzo(a)Pyrene	GC/MS	0.1	mg/kg	M	**1.8**	**0.6**	**0.2**	**0.2**	-
Benzo(a)Pyrene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Indeno(123-cd)Pyrene	GC/MS	0.1	mg/kg	M	**1.0**	**0.4**	**0.1**	**0.1**	-
Indeno(123-cd)Pyrene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Dibenzo(ah)Anthracene	GC/MS	0.1	mg/kg	M	**0.4**	**0.1**	<0.1	<0.1	-
Dibenzo(ah)Anthracene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Benzo(ghi)Perylene	GC/MS	0.1	mg/kg	M	**1.1**	**0.4**	**0.1**	**0.1**	-
Benzo(ghi)Perylene	GC/MS	0.1	mg/kg	U	-	-	-	-	<0.1
Polyaromatic Hydrocarbons (Total)	GC/MS	0.1	mg/kg	U	**18**	**6.0**	**2.2**	**2.2**	**0.2**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
PCBs EC7 (SE)

				SAL Reference	**577812 016**	**577812 032**	**577812 040**	**577812 049**	**577812 050**
				Customer Sample Reference	**TP01-TM @ 0.5m**	**TP03-TM @ 1.0m**	**TP04-TM @ 0.5m**	**TP05-TM @ 0.5m**	**TP05-TM @ 1.0m**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Date Sampled	**06-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**	**01-JUN-2016**
				Type	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**	**Fill**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Polychlorinated biphenyl BZ#101	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#101	GC/MS	20	µg/kg	U	-	-	-	-	<20
Polychlorinated biphenyl BZ#118	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#118	GC/MS	20	µg/kg	U	-	-	-	-	<20
Polychlorinated biphenyl BZ#138	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#138	GC/MS	20	µg/kg	U	-	-	-	-	<20
Polychlorinated biphenyl BZ#153	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#153	GC/MS	20	µg/kg	U	-	-	-	-	<20
Polychlorinated biphenyl BZ#180	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#180	GC/MS	20	µg/kg	U	-	-	-	-	<20
Polychlorinated biphenyl BZ#28	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#28	GC/MS	20	µg/kg	U	-	-	-	-	<20
Polychlorinated biphenyl BZ#52	GC/MS	20	µg/kg	M	<20	<20	<20	<20	-
Polychlorinated biphenyl BZ#52	GC/MS	20	µg/kg	U	-	-	-	-	<20

Index to symbols used in 577812-1 A

Value	Description
AR	As Received
10:1 S	Data for BS EN 12457-2 (10:1)
A40	Assisted dried < 40C
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Limited
Retained on 2mm is removed before analysis
050 - Samples submitted for GC/MS (Headspace) analysis were submitted in inappropriate containers. It is possible therefore that the results provided may be compromised.
Reported results on as received samples are corrected to a 105 degree centigrade dry weight basis except Mineral Oil
PAHs, TPH c10-c40, PCBs and BTEX - These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised.

SCIENTIFIC ANALYSIS LABORATORIES
DELIVERING SCIENCE

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: 581849-1

Date of Report: 07-Jul-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001301
Customer Site Reference: Iberdrola
Date Job Received at SAL: 01-Jul-2016
Date Analysis Started: 02-Jul-2016
Date Analysis Completed: 07-Jul-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

Report checked and authorised by :
Chelsea Entwistle
Project Management

Issued by :
Chelsea Entwistle
Project Management

SAL Reference: 581849
Project Site: Iberdrola
Customer Reference: 1CO101165

Water Analysed as Water
Suite F1

	SAL Reference	581849 001	581849 002	581849 003
	Customer Sample Reference	BH01-TM	BH02-TM	BH03-TM
	Date Sampled	30-JUN-2016	30-JUN-2016	30-JUN-2016

Determinand	Method	Test Sample	LOD	Units			
As (Dissolved)	T281	F	0.0002	mg/l	**0.0010**	**0.026**	**0.0025**
B (Dissolved)	T281	F	0.05	mg/l	**0.09**	**2.0**	**0.99**
Cd (Dissolved)	T281	F	0.00002	mg/l	**0.00003**	**0.00065**	**0.00005**
Cr (Dissolved)	T281	F	0.001	mg/l	**0.004**	(149) <0.010	**0.004**
Cu (Dissolved)	T281	F	0.0005	mg/l	**0.0011**	**0.0090**	**0.0025**
Pb (Dissolved)	T281	F	0.0003	mg/l	**0.0006**	**0.0028**	**0.0006**
Hg (Dissolved)	T281	F	0.00005	mg/l	<0.00005	(149) <0.00050	<0.00005
Ni (Dissolved)	T281	F	0.001	mg/l	**0.008**	**0.051**	**0.015**
Se (Dissolved)	T281	F	0.0005	mg/l	**0.0038**	(149) <0.0050	**0.0016**
Zn (Dissolved)	T281	F	0.002	mg/l	**0.005**	**0.071**	**0.011**
Cyanide(Total)	T546	F	0.01	mg/l	<0.01	<0.01	<0.01
Ammoniacal nitrogen	T686	F	0.05	mg/l	**0.09**	**270**	**0.22**
Biochemical Oxygen Demand (Allyl Thiourea)	T264	F	1	mg/l	**5**	**6**	**5**
pH	T7	F			**7.7**	**7.9**	**7.8**
Chemical Oxygen Demand	T221	F	20	mg/l	<20	**89**	**21**
Phenols(Mono)	T546	F	0.02	mg/l	<0.02	<0.02	<0.02
Chloride	T686	F	1	mg/l	**19**	**170**	**44**
Nitrate	T686	F	0.5	mg/l	**18**	**10**	**110**
Sulphate	T686	F	0.5	mg/l	**22**	**1000**	**270**
Nitrite	T686	F	0.1	mg/l	**0.2**	**0.3**	**0.9**
Total Hardness expressed as CaCO3	T649	F	10	mg/l	**460**	**850**	**660**
TPH (C10-C40)	T219	AR	20	µg/l	**80**	**460**	**150**

SAL Reference: 581849
Project Site: Iberdrola
Customer Reference: 1CO101165

Water Analysed as Water
Total and Speciated USEPA16 PAH (SE)

	SAL Reference	581849 001	581849 002	581849 003
	Customer Sample Reference	BH01-TM	BH02-TM	BH03-TM
	Date Sampled	30-JUN-2016	30-JUN-2016	30-JUN-2016

Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T149	AR	0.01	µg/l	**0.03**	**0.12**	**0.02**
Acenaphthylene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Acenaphthene	T149	AR	0.01	µg/l	<0.01	**0.15**	<0.01
Fluorene	T149	AR	0.01	µg/l	<0.01	**0.11**	<0.01
Phenanthrene	T149	AR	0.01	µg/l	<0.01	**0.09**	<0.01
Anthracene	T149	AR	0.01	µg/l	<0.01	**0.05**	<0.01
Fluoranthene	T149	AR	0.01	µg/l	<0.01	**0.05**	<0.01
Pyrene	T149	AR	0.01	µg/l	<0.01	**0.04**	<0.01
Benzo(a)Anthracene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Chrysene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(a)Pyrene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(ghi)Perylene	T149	AR	0.01	µg/l	<0.01	<0.01	<0.01
PAH(total)	T149	AR	0.01	µg/l	**0.03**	**0.60**	**0.02**

Index to symbols used in 581849-1

Value	Description
F	Filtered
AR	As Received
149	LOD raised due to high dissolved solids
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T281	ICP/MS (Filtered)
T686	Discrete Analyser
T264	Probe (Incubation Carbonaceous) (5 Days)
T546	Colorimetry (CF)
T219	GC/FID (SE)
T221	Colorimetry (CE)
T649	ICP/OES (Calc)
T7	Probe
T149	GC/MS (SIR)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
As (Dissolved)	T281	F	0.0002	mg/l	U	001-003
B (Dissolved)	T281	F	0.05	mg/l	U	001-003
Cd (Dissolved)	T281	F	0.00002	mg/l	U	001-003
Cr (Dissolved)	T281	F	0.001	mg/l	U	001-003
Cu (Dissolved)	T281	F	0.0005	mg/l	U	001-003
Pb (Dissolved)	T281	F	0.0003	mg/l	U	001-003
Hg (Dissolved)	T281	F	0.00005	mg/l	U	001-003
Ni (Dissolved)	T281	F	0.001	mg/l	U	001-003
Se (Dissolved)	T281	F	0.0005	mg/l	U	001-003
Zn (Dissolved)	T281	F	0.002	mg/l	U	001-003
Ammoniacal nitrogen	T686	F	0.05	mg/l	U	001-003
Cyanide(Total)	T546	F	0.01	mg/l	U	001-003
Biochemical Oxygen Demand (Allyl Thiourea)	T264	F	1	mg/l	N	001-003
Chemical Oxygen Demand	T221	F	20	mg/l	N	001-003
pH	T7	F			U	001-003
Chloride	T686	F	1	mg/l	U	001-003
Phenols(Mono)	T546	F	0.02	mg/l	U	001-003
Nitrate	T686	F	0.5	mg/l	U	001-003
Sulphate	T686	F	0.5	mg/l	U	001-003
Nitrite	T686	F	0.1	mg/l	U	001-003
Total Hardness expressed as CaCO3	T649	F	10	mg/l	U	001-003
TPH (C10-C40)	T219	AR	20	µg/l	U	001-003
Naphthalene	T149	AR	0.01	µg/l	U	001-003
Acenaphthylene	T149	AR	0.01	µg/l	U	001-003
Acenaphthene	T149	AR	0.01	µg/l	U	001-003
Fluorene	T149	AR	0.01	µg/l	U	001-003
Phenanthrene	T149	AR	0.01	µg/l	U	001-003
Anthracene	T149	AR	0.01	µg/l	U	001-003
Fluoranthene	T149	AR	0.01	µg/l	U	001-003
Pyrene	T149	AR	0.01	µg/l	U	001-003
Benzo(a)Anthracene	T149	AR	0.01	µg/l	U	001-003
Chrysene	T149	AR	0.01	µg/l	U	001-003
Benzo(b)fluoranthene	T149	AR	0.01	µg/l	N	001-003
Benzo(k)fluoranthene	T149	AR	0.01	µg/l	U	001-003
Benzo(a)Pyrene	T149	AR	0.01	µg/l	U	001-003
Indeno(123-cd)Pyrene	T149	AR	0.01	µg/l	U	001-003
Dibenzo(ah)Anthracene	T149	AR	0.01	µg/l	U	001-003
Benzo(ghi)Perylene	T149	AR	0.01	µg/l	U	001-003
PAH(total)	T149	AR	0.01	µg/l	N	001-003

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Scientific Analysis Laboratories Ltd

Certificate of Analysis

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Report Number: 569599-1

Date of Report: 19-May-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001088
Customer Site Reference: Tuddenham
Date Job Received at SAL: 13-May-2016
Date Analysis Started: 16-May-2016
Date Analysis Completed: 19-May-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Claire Brown Crociquia
Customer Service Manager

SAL Reference: 569599
Project Site: Tuddenham
Customer Reference: 1CO101165

Water Analysed as Water
Miscellaneous

				SAL Reference	**569599 001**	**569599 002**	**569599 003**	**569599 004**	**569599 005**	**569599 006**
				Customer Sample Reference	**A - FYN013**	**B - FYN014**	**C - FYN016**	**D - FYN011**	**E - FYN018**	**F - FYN018**
				Date Sampled	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Ammonia expressed as NH3	T686	F	0.05	mg/l	**46**	**50**	**0.86**	**0.10**	**0.14**	**0.60**
BOD (ATU)	T264	AR	1	mg/l	**6**	**3**	**2**	**4**	**4**	**2**
Chemical Oxygen Demand	T221	AR	20	mg/l	**44**	**60**	**21**	**27**	**28**	**25**
Chloride	T686	F	1	mg/l	**93**	**100**	**64**	**59**	**63**	**60**
Diss Oxygen	T7	AR	1.0	mg/l	**6.7**	**5.7**	**8.1**	**11**	**7.6**	**10**
Electrical Conductivity	T7	AR	1	µS/cm	**1800**	**2000**	**1100**	**870**	**1100**	**930**
Nitrate	T686	F	0.5	mg/l	**26**	**47**	**61**	**28**	**61**	**30**
Sulphate	T686	F	0.5	mg/l	**300**	**380**	**150**	**78**	**150**	**87**
Total Hardness expressed as CaCO3	T649	AR	10	mg/l	**730**	**720**	**580**	**380**	**590**	**400**
pH	T7	AR			**7.3**	**7.7**	**8.0**	**8.3**	**8.0**	**8.2**

SAL Reference: 569599
Project Site: Tuddenham
Customer Reference: 1CO101165

Water Analysed as Water
VOC (SE)

					SAL Reference	569599 001	569599 002	569599 003	569599 004	569599 005	569599 006
					Customer Sample Reference	A - FYN013	B - FYN014	C - FYN016	D - FYN011	E - FYN018	F - FYN018
					Date Sampled	12-MAY-2016	12-MAY-2016	12-MAY-2016	12-MAY-2016	12-MAY-2016	12-MAY-2016
Determinand	**Method**	**Test Sample**	**LOD**	**Units**							
1,1,1,2-Tetrachloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-Chloropropane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2-dibromoethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Ethyl-2-Methylbenzene	T54	AR	5	µg/l		<5	<5	<5	<5	<5	<5
2,2-Dichloropropane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
2-Chlorotoluene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
4-Chlorotoluene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Benzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Bromobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Bromochloromethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Bromodichloromethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Bromoform	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Bromomethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Carbon tetrachloride	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Chlorobenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Chloroethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Chloroform	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Chloromethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Cis-1,2-Dichloroethylene	T54	AR	1	µg/l		**6**	<1	<1	<1	<1	<1
Cis-1,3-Dichloropropene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Dibromochloromethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Dibromomethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
EthylBenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Isopropyl benzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
m/p ethyl toluene	T54	AR	5	µg/l		<5	<5	<5	<5	<5	<5
M/P Xylene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
n-Butylbenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
n-Propylbenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
O Xylene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
S-Butylbenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Styrene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
T-Butylbenzene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Tertiary amyl methyl ether	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Tetrachloroethene	T54	AR	1	µg/l		**5**	**2**	<1	<1	<1	<1
Toluene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Trans-1,2-Dichloroethene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Trans-1,3-Dichloropropene	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1
Trichloroethene	T54	AR	1	µg/l		**2**	<1	<1	<1	<1	<1
Trichlorofluoromethane	T54	AR	1	µg/l		<1	<1	<1	<1	<1	<1

SAL Reference: 569599
Project Site: Tuddenham
Customer Reference: 1CO101165

Water Analysed as Water
VOC (SE)

				SAL Reference	**569599 001**	**569599 002**	**569599 003**	**569599 004**	**569599 005**	**569599 006**
				Customer Sample Reference	**A - FYN013**	**B - FYN014**	**C - FYN016**	**D - FYN011**	**E - FYN018**	**F - FYN018**
				Date Sampled	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**	**12-MAY-2016**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Vinyl chloride	T54	AR	1	µg/l	<1	<1	<1	<1	<1	<1

Index to symbols used in 569599-1

Value	Description
F	Filtered
AR	As Received
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T264	Probe (Incubation Carbonaceous) (5 Days)
T7	Probe
T649	ICP/OES (Calc)
T54	GC/MS (Headspace)
T686	Discrete Analyser
T221	Colorimetry (CE)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Ammonia expressed as NH3	T686	F	0.05	mg/l	U	001-006
BOD (ATU)	T264	AR	1	mg/l	N	001-006
Chemical Oxygen Demand	T221	AR	20	mg/l	N	001-006
Chloride	T686	F	1	mg/l	U	001-006
Diss Oxygen	T7	AR	1.0	mg/l	N	001-006
Electrical Conductivity	T7	AR	1	µS/cm	U	001-006
Nitrate	T686	F	0.5	mg/l	U	001-006
Sulphate	T686	F	0.5	mg/l	U	001-006
Total Hardness expressed as CaCO3	T649	AR	10	mg/l	U	001-006
pH	T7	AR			U	001-006
1,1,1,2-Tetrachloroethane	T54	AR	1	µg/l	N	001-006
1,1,1-Trichloroethane	T54	AR	1	µg/l	U	001-006
1,1,2,2-Tetrachloroethane	T54	AR	1	µg/l	N	001-006
1,1,2-Trichloroethane	T54	AR	1	µg/l	U	001-006
1,1-Dichloroethane	T54	AR	1	µg/l	U	001-006
1,1-Dichloroethylene	T54	AR	1	µg/l	U	001-006
1,1-Dichloropropene	T54	AR	1	µg/l	U	001-006
1,2,3-Trichlorobenzene	T54	AR	1	µg/l	U	001-006
1,2,3-Trichloropropane	T54	AR	1	µg/l	N	001-006
1,2,4-Trichlorobenzene	T54	AR	1	µg/l	U	001-006
1,2,4-Trimethylbenzene	T54	AR	1	µg/l	U	001-006
1,2-Dibromo-3-Chloropropane	T54	AR	1	µg/l	N	001-006
1,2-dibromoethane	T54	AR	1	µg/l	N	001-006
1,2-Dichlorobenzene	T54	AR	1	µg/l	U	001-006
1,2-Dichloroethane	T54	AR	1	µg/l	U	001-006
1,2-Dichloropropane	T54	AR	1	µg/l	U	001-006
1,3,5-Trimethylbenzene	T54	AR	1	µg/l	U	001-006
1,3-Dichlorobenzene	T54	AR	1	µg/l	U	001-006
1,3-Dichloropropane	T54	AR	1	µg/l	U	001-006
1,4-Dichlorobenzene	T54	AR	1	µg/l	U	001-006
Ethyl-2-Methylbenzene	T54	AR	5	µg/l	U	001-006
2,2-Dichloropropane	T54	AR	1	µg/l	U	001-006
2-Chlorotoluene	T54	AR	1	µg/l	U	001-006

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
4-Chlorotoluene	T54	AR	1	µg/l	U	001-006
Benzene	T54	AR	1	µg/l	U	001-006
Bromobenzene	T54	AR	1	µg/l	U	001-006
Bromochloromethane	T54	AR	1	µg/l	U	001-006
Bromodichloromethane	T54	AR	1	µg/l	U	001-006
Bromoform	T54	AR	1	µg/l	N	001-006
Bromomethane	T54	AR	1	µg/l	U	001-006
Carbon tetrachloride	T54	AR	1	µg/l	U	001-006
Chlorobenzene	T54	AR	1	µg/l	U	001-006
Chloroethane	T54	AR	1	µg/l	U	001-006
Chloroform	T54	AR	1	µg/l	U	001-006
Chloromethane	T54	AR	1	µg/l	U	001-006
Cis-1,2-Dichloroethylene	T54	AR	1	µg/l	U	001-006
Cis-1,3-Dichloropropene	T54	AR	1	µg/l	U	001-006
Dibromochloromethane	T54	AR	1	µg/l	U	001-006
Dibromomethane	T54	AR	1	µg/l	U	001-006
Dichlorodifluoromethane	T54	AR	1	µg/l	N	001-006
EthylBenzene	T54	AR	1	µg/l	U	001-006
Hexachlorobutadiene	T54	AR	1	µg/l	N	001-006
Isopropyl benzene	T54	AR	1	µg/l	U	001-006
m/p ethyl toluene	T54	AR	5	µg/l	U	001-006
M/P Xylene	T54	AR	1	µg/l	U	001-006
Methyl tert-Butyl Ether	T54	AR	1	µg/l	U	001-006
n-Butylbenzene	T54	AR	1	µg/l	U	001-006
n-Propylbenzene	T54	AR	1	µg/l	U	001-006
O Xylene	T54	AR	1	µg/l	U	001-006
p-Isopropyltoluene	T54	AR	1	µg/l	U	001-006
S-Butylbenzene	T54	AR	1	µg/l	U	001-006
Styrene	T54	AR	1	µg/l	U	001-006
T-Butylbenzene	T54	AR	1	µg/l	U	001-006
Tertiary amyl methyl ether	T54	AR	1	µg/l	U	001-006
Tetrachloroethene	T54	AR	1	µg/l	U	001-006
Toluene	T54	AR	1	µg/l	U	001-006
Trans-1,2-Dichloroethene	T54	AR	1	µg/l	U	001-006
Trans-1,3-Dichloropropene	T54	AR	1	µg/l	U	001-006
Trichloroethene	T54	AR	1	µg/l	U	001-006
Trichlorofluoromethane	T54	AR	1	µg/l	U	001-006
Vinyl chloride	T54	AR	1	µg/l	U	001-006

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Scientific Analysis Laboratories Ltd

Certificate of Analysis

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Report Number: 575461-1

Date of Report: 15-Jun-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001088
Customer Site Reference: Tuddenham
Date Job Received at SAL: 07-Jun-2016
Date Analysis Started: 08-Jun-2016
Date Analysis Completed: 15-Jun-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Claire Brown Crociquia
Customer Service Manager

SAL Reference: 575461
Project Site: Tuddenham
Customer Reference: 1CO101165

Water Analysed as Water
Miscellaneous

SAL Reference	**575461 001**
Customer Sample Reference	**FYN020**
Date Sampled	**06-JUN-2016**

Determinand	Method	Test Sample	LOD	Units	
Ammonia expressed as NH3	T686	F	0.05	mg/l	**0.12**
Biochemical Oxygen Demand (Allyl Thiourea)	T264	AR	1	mg/l	**4**
Chemical Oxygen Demand	T221	AR	20	mg/l	<20
Chloride	T686	F	1	mg/l	**54**
Diss Oxygen	T7	AR	1.0	mg/l	**5.7**
Electrical Conductivity	T7	AR	1	µS/cm	**950**
Nitrate	T686	F	0.5	mg/l	**40**
Sulphate	T686	F	0.5	mg/l	**95**
Total Hardness expressed as CaCO3	T649	AR	10	mg/l	**420**
pH	T7	AR			**7.9**

SAL Reference: 575461
Project Site: Tuddenham
Customer Reference: 1CO101165

Water Analysed as Water
VOC (SE)

SAL Reference	**575461 001**
Customer Sample Reference	**FYN020**
Date Sampled	**06-JUN-2016**

Determinand	Method	Test Sample	LOD	Units	
1,1,1,2-Tetrachloroethane	T54	AR	1	µg/l	<1
1,1,1-Trichloroethane	T54	AR	1	µg/l	<1
1,1,2,2-Tetrachloroethane	T54	AR	1	µg/l	<1
1,1,2-Trichloroethane	T54	AR	1	µg/l	<1
1,1-Dichloroethane	T54	AR	1	µg/l	<1
1,1-Dichloroethylene	T54	AR	1	µg/l	<1
1,1-Dichloropropene	T54	AR	1	µg/l	<1
1,2,3-Trichlorobenzene	T54	AR	1	µg/l	<1
1,2,3-Trichloropropane	T54	AR	1	µg/l	<1
1,2,4-Trichlorobenzene	T54	AR	1	µg/l	<1
1,2,4-Trimethylbenzene	T54	AR	1	µg/l	<1
1,2-Dibromo-3-Chloropropane	T54	AR	1	µg/l	<1
1,2-dibromoethane	T54	AR	1	µg/l	<1
1,2-Dichlorobenzene	T54	AR	1	µg/l	<1
1,2-Dichloroethane	T54	AR	1	µg/l	<1
1,2-Dichloropropane	T54	AR	1	µg/l	<1
1,3,5-Trimethylbenzene	T54	AR	1	µg/l	<1
1,3-Dichlorobenzene	T54	AR	1	µg/l	<1
1,3-Dichloropropane	T54	AR	1	µg/l	<1
1,4-Dichlorobenzene	T54	AR	1	µg/l	<1
Ethyl-2-Methylbenzene	T54	AR	5	µg/l	<5
2,2-Dichloropropane	T54	AR	1	µg/l	<1
2-Chlorotoluene	T54	AR	1	µg/l	<1
4-Chlorotoluene	T54	AR	1	µg/l	<1
Benzene	T54	AR	1	µg/l	<1
Bromobenzene	T54	AR	1	µg/l	<1
Bromochloromethane	T54	AR	1	µg/l	<1
Bromodichloromethane	T54	AR	1	µg/l	<1
Bromoform	T54	AR	1	µg/l	<1
Bromomethane	T54	AR	1	µg/l	<1
Carbon tetrachloride	T54	AR	1	µg/l	<1
Chlorobenzene	T54	AR	1	µg/l	<1
Chloroethane	T54	AR	1	µg/l	<1
Chloroform	T54	AR	1	µg/l	<1
Chloromethane	T54	AR	1	µg/l	<1
Cis-1,2-Dichloroethylene	T54	AR	1	µg/l	<1
Cis-1,3-Dichloropropene	T54	AR	1	µg/l	<1
Dibromochloromethane	T54	AR	1	µg/l	<1
Dibromomethane	T54	AR	1	µg/l	<1
Dichlorodifluoromethane	T54	AR	1	µg/l	<1
EthylBenzene	T54	AR	1	µg/l	<1
Hexachlorobutadiene	T54	AR	1	µg/l	<1
Isopropyl benzene	T54	AR	1	µg/l	<1
m/p ethyl toluene	T54	AR	5	µg/l	<5
M/P Xylene	T54	AR	1	µg/l	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/l	<1
n-Butylbenzene	T54	AR	1	µg/l	<1
n-Propylbenzene	T54	AR	1	µg/l	<1
O Xylene	T54	AR	1	µg/l	<1
p-Isopropyltoluene	T54	AR	1	µg/l	<1
S-Butylbenzene	T54	AR	1	µg/l	<1
Styrene	T54	AR	1	µg/l	<1
T-Butylbenzene	T54	AR	1	µg/l	<1
Tertiary amyl methyl ether	T54	AR	1	µg/l	<1
Tetrachloroethene	T54	AR	1	µg/l	<1
Toluene	T54	AR	1	µg/l	<1
Trans-1,2-Dichloroethene	T54	AR	1	µg/l	<1
Trans-1,3-Dichloropropene	T54	AR	1	µg/l	<1
Trichloroethene	T54	AR	1	µg/l	<1
Trichlorofluoromethane	T54	AR	1	µg/l	<1

SAL Reference:	575461
Project Site:	Tuddenham
Customer Reference:	1CO101165

Water Analysed as Water
VOC (SE)

SAL Reference	**575461 001**
Customer Sample Reference	**FYN020**
Date Sampled	**06-JUN-2016**

Determinand	Method	Test Sample	LOD	Units	
Vinyl chloride	T54	AR	1	µg/l	<1

Index to symbols used in 575461-1

Value	Description
F	Filtered
AR	As Received
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T264	Probe (Incubation Carbonaceous) (5 Days)
T649	ICP/OES (Calc)
T221	Colorimetry (CE)
T7	Probe
T54	GC/MS (Headspace)
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Ammonia expressed as NH3	T686	F	0.05	mg/l	U	001
Biochemical Oxygen Demand (Allyl Thiourea)	T264	AR	1	mg/l	N	001
Chemical Oxygen Demand	T221	AR	20	mg/l	N	001
Chloride	T686	F	1	mg/l	U	001
Diss Oxygen	T7	AR	1.0	mg/l	N	001
Electrical Conductivity	T7	AR	1	µS/cm	U	001
Nitrate	T686	F	0.5	mg/l	U	001
Sulphate	T686	F	0.5	mg/l	U	001
Total Hardness expressed as CaCO3	T649	AR	10	mg/l	U	001
pH	T7	AR			U	001
1,1,1,2-Tetrachloroethane	T54	AR	1	µg/l	N	001
1,1,1-Trichloroethane	T54	AR	1	µg/l	U	001
1,1,2,2-Tetrachloroethane	T54	AR	1	µg/l	N	001
1,1,2-Trichloroethane	T54	AR	1	µg/l	U	001
1,1-Dichloroethane	T54	AR	1	µg/l	U	001
1,1-Dichloroethylene	T54	AR	1	µg/l	U	001
1,1-Dichloropropene	T54	AR	1	µg/l	U	001
1,2,3-Trichlorobenzene	T54	AR	1	µg/l	U	001
1,2,3-Trichloropropane	T54	AR	1	µg/l	N	001
1,2,4-Trichlorobenzene	T54	AR	1	µg/l	U	001
1,2,4-Trimethylbenzene	T54	AR	1	µg/l	U	001
1,2-Dibromo-3-Chloropropane	T54	AR	1	µg/l	N	001
1,2-dibromoethane	T54	AR	1	µg/l	N	001
1,2-Dichlorobenzene	T54	AR	1	µg/l	U	001
1,2-Dichloroethane	T54	AR	1	µg/l	U	001
1,2-Dichloropropane	T54	AR	1	µg/l	U	001
1,3,5-Trimethylbenzene	T54	AR	1	µg/l	U	001
1,3-Dichlorobenzene	T54	AR	1	µg/l	U	001
1,3-Dichloropropane	T54	AR	1	µg/l	U	001
1,4-Dichlorobenzene	T54	AR	1	µg/l	U	001
Ethyl-2-Methylbenzene	T54	AR	5	µg/l	U	001
2,2-Dichloropropane	T54	AR	1	µg/l	U	001
2-Chlorotoluene	T54	AR	1	µg/l	U	001

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
4-Chlorotoluene	T54	AR	1	µg/l	U	001
Benzene	T54	AR	1	µg/l	U	001
Bromobenzene	T54	AR	1	µg/l	U	001
Bromochloromethane	T54	AR	1	µg/l	U	001
Bromodichloromethane	T54	AR	1	µg/l	U	001
Bromoform	T54	AR	1	µg/l	N	001
Bromomethane	T54	AR	1	µg/l	U	001
Carbon tetrachloride	T54	AR	1	µg/l	U	001
Chlorobenzene	T54	AR	1	µg/l	U	001
Chloroethane	T54	AR	1	µg/l	U	001
Chloroform	T54	AR	1	µg/l	U	001
Chloromethane	T54	AR	1	µg/l	U	001
Cis-1,2-Dichloroethylene	T54	AR	1	µg/l	U	001
Cis-1,3-Dichloropropene	T54	AR	1	µg/l	U	001
Dibromochloromethane	T54	AR	1	µg/l	U	001
Dibromomethane	T54	AR	1	µg/l	U	001
Dichlorodifluoromethane	T54	AR	1	µg/l	N	001
EthylBenzene	T54	AR	1	µg/l	U	001
Hexachlorobutadiene	T54	AR	1	µg/l	N	001
Isopropyl benzene	T54	AR	1	µg/l	U	001
m/p ethyl toluene	T54	AR	5	µg/l	U	001
M/P Xylene	T54	AR	1	µg/l	U	001
Methyl tert-Butyl Ether	T54	AR	1	µg/l	U	001
n-Butylbenzene	T54	AR	1	µg/l	U	001
n-Propylbenzene	T54	AR	1	µg/l	U	001
O Xylene	T54	AR	1	µg/l	U	001
p-Isopropyltoluene	T54	AR	1	µg/l	U	001
S-Butylbenzene	T54	AR	1	µg/l	U	001
Styrene	T54	AR	1	µg/l	U	001
T-Butylbenzene	T54	AR	1	µg/l	U	001
Tertiary amyl methyl ether	T54	AR	1	µg/l	U	001
Tetrachloroethene	T54	AR	1	µg/l	U	001
Toluene	T54	AR	1	µg/l	U	001
Trans-1,2-Dichloroethene	T54	AR	1	µg/l	U	001
Trans-1,3-Dichloropropene	T54	AR	1	µg/l	U	001
Trichloroethene	T54	AR	1	µg/l	U	001
Trichlorofluoromethane	T54	AR	1	µg/l	U	001
Vinyl chloride	T54	AR	1	µg/l	U	001

Appendix 4 Photograph Appendix

TP01-TM

Long face

Short face

Spoil

Spoil

TP02-TM

Long face

Short face

Long face and short face

Spoil

TP03-TM

Long face

Short face

Spoil

Location backfilled

TP04-TM

Long face

Short face

Spoil

Location backfilled

TP05-TM

Long face

Short face

Spoil

Location backfilled

TP06-TM

Long face

Short face

Spoil

Location backfilled

Appendix 5 Surface Water Monitoring

Field Testing Equipment	Model	Field Technician
YSI Hydrodata	556mps	Charlotte Toth
EIJKELKAMP	12v Peristaltic Pump	

Location	Water Level(m)	Temp (°C)	pH	Spec.Cond. (us/cm)	DO (mg/L)	ORP (m/V)	eH pHmv	Colour/Odour
A FYN013	-	17.82	6.99	0.90	-12.9	-4.2	-	Clear/ No odour
B FYN014	-	19.60	7.02	0.090	53.3	-18.4	-6.3	Clear/ No odour
C FYN016	-	19.5	7.02	0.090	28.2	-18	-6.2	Clear/ No odour
D FYN011	-	19.85	7.01	0.089	52.5	-14.3	-5.7	Clear/ No odour
E FYN018	-	19.57	7.08	0.089	25.2	-33.9	-9.8	Clear/ No odour
F FYN018	-	20	7.17	0.087	37.0	-26.5	-14.7	Clear/ No odour

East Anglia ONE
Offshore Windfarm

East Anglia ONE Offshore Windfarm

Site Works Report – Culpho Hall

ID: EA1-CON-R-IBR-1CO101165P2R2

Created by / date: Charlotte Toth / 22nd August 2016
Checked by / date: Marc Roberts / 22nd August 2016
Approved by / date: Stuart Phillips / 22nd August 2016

SCOTTISHPOWER RENEWABLES

REVISION CONTROL

Revision and Approvals					
Rev	**Date**	**Reason for Issue**	**Originated by**	**Checked by**	**Approved by**
0	27-06-2016	Draft for internal review	CT	IM/JD	
1	29-07-2016	Final issue	CT	M/JD	
2	22-08-2016	Final issue following client amendments	CT	IM/JD	

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Appendices

Abbreviations

AC – Alternating Current
BH - Borehole
CEC – Cation Exchange Capacity
CfD – Contract for Difference
DC – Direct Current
DCO – Development Consent Order
DECC – Department for Energy and Climate Change
EAOL – East Anglia One Limited
ES – Environmental Statement
EQS – Environmental Quality Standard
HVAC – High Voltage Alternating Current
HVDC – High Voltage Direct Current
LPA – Local Planning Authority
MW – Megawatts
PAHs – Polyaromatic Aromatic Hydrocarbons
SPR – ScottishPower Renewables
sVOCs – Semi Volatile Organic Compounds
TOC – Total Organic Carbon
TP – Trial Pit
WAC – Waste Acceptance Criteria

1 Introduction

1.1 Project Overview

1. Resource and Environmental Consultants (REC) Ltd has been commissioned by Iberdrola Engineering and Construction (IEC) herein referenced as "the Client" to undertake a ground investigation at "Culpho Hall" herein referenced as "the Site" in order to discharge Planning Condition 17 for the proposed development which relates to Contaminated Land and Ground Water.

2. Instructions to proceed were detailed in the contract documents for the Site dated 13th April 2016. The following documents were issued to REC prior to commencement of works:

- East Anglia ONE Offshore Windfarm – Selected Geo-environmental Ground Investigation of Onshore Cable Route. Technical Specification (Ref: EA1-CON-I-IBR-001436 Rev0), dated November 2015;
- East Anglia ONE Offshore Windfarm – Phase 1 Desk Study Report by IEC (Ref No IEC-EHWF-1A8L-01-Rev0), dated August 2015;
- Indicative exploratory hole locations:
    - EA1-GRD-DG-IEC-007731_Proposed Exploratory Hole Location Plan Culpho Hall Landfill Rev 0B.pdf
    - EA1-GRD-DG-IEC-007732_Proposed Exploratory Hole Location Plan Tuddenham St Martin Landfill Rev 0A.pdf
    - EA1-GRD-DG-IEC-007733_Spring_Sampling_Tuddenham_Landfill Rev 0B.pdf

1.2 Purpose and Scope

3. The purpose of the Ground Investigation was to identify any areas of contaminated ground in relation to suspected landfill locations along a section of the 37km East Anglia ONE Onshore Cable Route, which forms part of the consented East Anglia One Offshore Windfarm (EAOW).

1.3 Duration of Investigation

4. Site work was carried out between 2nd and 6th June 2016.

1.4 Limitations

5. The comments and opinions expressed in this report are based on the ground conditions encountered during the site work and the results of tests carried out in the field and in the laboratory. There may however, be special conditions prevailing on the Site which have not been disclosed by this investigation and which have not been taken into account by this report. The full limitations of this report are presented in Appendix 1.

1.5 Confidentiality

6. REC has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from REC; a charge may be levied against such approval.

2 Site Investigation

2.1 Summary of Information Provided

1.1.1 Site Details

Site Address	Unnamed Road, Ipswich, Suffolk, IP6 9DE
National Grid Reference	TM 20463 48417
Site Area	1.3 Ha

2.1.1 Site Description and Topography

7. The Site comprises a triangular field to the south of Culpho Hall, the rectangular field to the north and the fields directly to the east and west. All fields are used for arable farming and at the time of the investigation the fields were predominately established with tall grass. The area has been identified as Culpho Hall Landfill from the information provided by IEC. There is a discrepancy over the historic location of this landfill with differing locations shown on maps. There is a slight slope north to south across the site.

2.1.2 Geology

8. The published geology indicates ground conditions to comprise superficial deposits of the Kesgrave Catchment Subgroup comprising sand and gravel.

9. The bedrock geology is indicated to consist of Crag Formation comprising Sand.

2.2 Scope

10. The scope of intrusive works was provided by the Client within the Technical Specification (Ref: EA1-CON-I-IBR-001436 Rev0) comprised the following:

- A minimum of 10 No. mechanically excavated trial pits/ trenches to depths of up to 2.50m below ground level (bgl);
    - The limits of Made Ground deposits along the cable route corridor within the landfill to be confirmed by trial trenching prior to any boreholes being drilled;
    - During trial pitting, environmental soil samples for potential analysis to be obtained within Made Ground deposits at half metre intervals; and
    - Throughout trial pitting, representative disturbed soil samples for material description to be obtained.
- Chemical laboratory analysis;
- Land gas and groundwater monitoring; and
- Factual Reporting.

3 Fieldwork

3.1 Summary of Fieldwork

11. Ground investigation works were completed between the 2nd and 6th June 2016 and are summarised in Table 3.1 below.

Table 3.1 Fieldwork Summary Table

Exploratory Hole Type	Exploratory Hole Reference	Depth (mbgl)	Further Detail
Machine Excavated Trial Pit	TP01-CH	2.5	**Rationale:** To establish the nature of the soils and determine whether a landfill is present
	TP03-CH	2.5	
	TP04-CH	2.5	
	TP05-CH	2.5	
	TP06-CH	2.5	
	TP07-CH	2.5	
	TP08-CH	2.8	
	TP09-CH	2.5	
	TP10-CH	2.5	
Cable Percussion Boreholes	n/a	n/a	Boreholes not required as Made Ground not encountered in Trial Pits

3.2 Site Investigation Standards

12. All exploratory hole work, associated sampling, in-situ testing and logging was carried out in accordance with techniques outlined in BS EN ISO 14688-1, Identification of soil, BS EN ISO 14688-2 classification of soil, BS EN ISO 22475, Sampling methods and groundwater measurements and BS EN ISO 22476 – Field Testing, as appropriate, at positions as near as practicable to those supplied by the client. These are shown on the exploratory hole location plan 1CO101165P2R0-002.

13. The depths of all exploratory holes, descriptions of the materials encountered and details of sampling are presented in Appendix 2.

3.3 Deviations from the Original Scope of Works

14. Deviations from the original scope of works, as provided by the Client, are presented in Table 3.2 below.

Table 3.2 Deviations from the Original Scope of Works

Exploratory Hole Location	Details
TP02-CH	Unable to carry out trial pit TP02-CH due to proximity of badger setts and the requirement to maintain an easement of at least 30m.

4 Laboratory Analysis

4.1 Chemical Laboratory Analysis

15. Chemical laboratory testing, scheduled by IEC's engineer, was carried out on samples taken from various strata by Scientific Analytical Laboratories (SAL) in Braintree. SAL are UKAS accredited for a wide range of chemical tests. Full laboratory results are located within Appendix 3.

16. Details of the specific tests scheduled by IEC are presented in Tables 4.1 and 4.2 below:

Table 4.1 Summary of Chemical Laboratory Analysis – Suite E

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Arsenic	2 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
Boron	1 mg/kg	ICP/OES (SIM)	-	9
Cadmium	0.1 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
Chromium (total)	0.5 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
Lead	2 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
Mercury	1 mg/kg	ICP/OES (Aqua Regia Extraction)	UKAS	9
Nickel	0.5 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
Zinc	2 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
pH	-	ICP/OES (SIM) (Aqua Regia Extraction)	MCERTS	9
Water soluble sulphate (as SO4)	0.01 g/l	2:1 Extraction/ICP/OES (TRL 447 T1)	MCERTS	9
Organic matter	0.1 %	Calc TOC/0.58	-	9
Total petroleum hydrocarbons	10 mg/kg	GC/FID (SE)	MCERTS	9
Speciated polyaromatic hydrocarbons (USEPA 16)	0.1 mg/kg	GC/MS	MCERTS/UKAS	9
Phenol	1 mg/kg	Colorimetry (CF)	MCERTS	9
Cyanide (total)	1 mg/kg	Colorimetry (CF)	MCERTS	9
Asbestos Bulk ID	-	PLM	UKAS	9
TPH CWG with BTEX (C6 to C35)	0.1-2mg/kg	GC/FID (SE) / GC/MS (Headspace)	-	9
Cyanide (free)	1 mg/kg	Colorimetry (CF)	MCERTS	9
Selenium	3 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	UKAS	9
Vanadium	0.1 mg/kg	ICP/OES (SIM) (Aqua Regia Extraction)	UKAS	9
Chloride	2 mg/kg	Discrete Analyser	-	9

Table 4.2 Summary of Chemical Laboratory Analysis – Suite F

Test Type and Determinants	Limit of Detection	Technique	Accreditation	No. Scheduled
Arsenic	0.2 µg/l	ICP/MS (Filtered)	UKAS	3
Boron	0.05 mg/l	ICP/MS (Filtered)	UKAS	3
Cadmium	0.02 µg/l	ICP/MS (Filtered)	UKAS	3
Chromium (total)	1 µg/l	ICP/MS (Filtered)	UKAS	3
Lead	0.3 µg/l	ICP/MS (Filtered)	UKAS	3
Mercury	0.05 µg/l	ICP/MS (Filtered)	UKAS	3
Nickel	1 µg/l	ICP/MS (Filtered)	UKAS	3
Zinc	2 µg/l	ICP/MS (Filtered)	UKAS	3
pH	-	Probe	UKAS	3
Water soluble sulphate (as SO4)	0.5 mg/l	Discrete Analyser	UKAS	3
Total petroleum hydrocarbons	20 µg/l	GC/FID (SE)	-	3
Speciated polyaromatic hydrocarbons (USEPA 16)	0.01 µg/l	GC/MS (SIR)	-	3
Phenol	0.02 mg/l	Colorimetry (CF)	UKAS	3
Cyanide (total)	0.01 mg/l	Colorimetry (CF)	UKAS	3
Ammoniacal nitrogen	0.05 mg/l	Discrete Analyser	UKAS	3
Total Hardness expressed as CaCO3	10 mg/l	ICP/OES (Calc)	UKAS	3
Nitrate	0.5 mg/l	Discrete Analyser	UKAS	3
Nitrite	0.1 mg/l	Discrete Analyser	UKAS	3
Chloride	1 mg/l	Discrete Analyser	UKAS	3
BOD	1 mg/l	Probe (Incubation Carbonaceous) (5 Days)	-	3
COD	20 mg/l	Colorimetry (CE)	-	3

5 Site Observations

5.1 Ground Conditions Observed

17. The ground investigation generally confirmed the published geology detailed in Section 2.1.3 and identified the strata set out below:

5.1.1 Topsoil

18. Topsoil was encountered in all of the exploratory hole locations and typically comprised dark brown slightly gravelly silty SAND with frequent rootlets. No visual or olfactory contamination was encountered within this stratum.

5.1.2 Kesgrave Catchment Subgroup

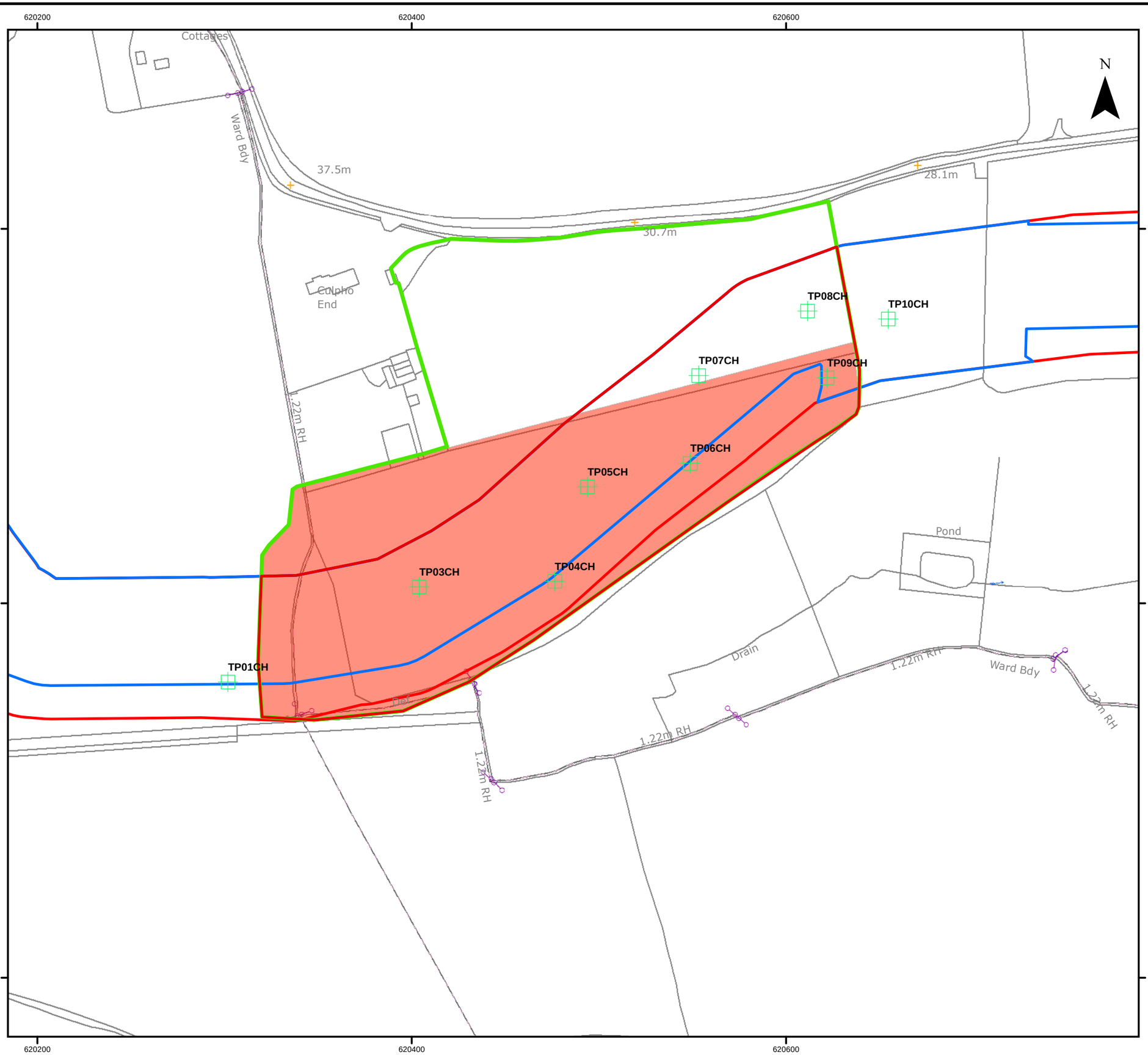
19. The Kesgrave Catchment Subgroup was encountered below the Topsoil in all of the exploratory hole locations. This stratum comprised light brown slightly silty slightly, slightly clayey gravelly SAND, typically becoming less gravelly with depth. No visual or olfactory contamination was encountered within this stratum.

5.2 Groundwater

20. The comments on groundwater conditions are based on the observations made at the time of the investigation. It should be noted that groundwater levels vary owing to seasonal and other effects.

21. Groundwater was encountered in one of the exploratory holes during the site works within TP10 as a seepage at 1.30mbgl. Details are given in the relevant Exploratory Hole Log.

Figure 1 Site Location Plans

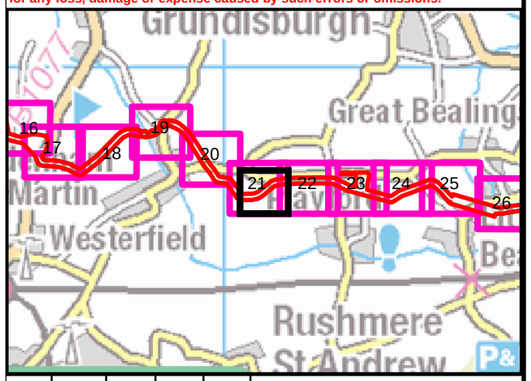


SCOTTISHPOWER RENEWABLES

LEGEND

- EA1 DCO Boundary
- Construction Corridor
- Culpho Trial Pits
- Investigation Area
- Potential Landfilling - Boundary uncertain
- Potentially Contaminated Land

Note:
This map has been produced to the latest known information at the time of issue, and has been produced for your information only.Please consult with the SPR GIS team to ensure the content is still current before using the information contained on this map.
To the fullest extent permitted by law, we accept no responsibility or liability (whether in contract, tort (including negligence) or otherwise in respect of any errors or omissions in the information contained in the map and shall not be liable for any loss, damage or expense caused by such errors or omissions.



ISSUE	DATE	DRAWN	CHKD	APPD	REVISION NOTES
0	29/07/16				FOR INFORMATION

DRAWING NUMBER	EA1-GRD-DG-IEC-021870 Rev 0
COORDINATE SYSTEM / DATUM	BNG / OSGB 1936
PROJECTION / UNITS	TRANSVERSE MERCATOR / METRE
PURPOSE	FOR INFORMATION
SCALE	1:2,000 (0, 50, 100 m)
ORIGINAL PLOT SIZE	A3
PROJECT TITLE	EA ONE CABLE ROUTE
DRAWING TITLE	CULPHO TRIAL PITS
DRAWING ID	1 OF 1
DRAWING PREPARED BY:	IBERDROLA Engineering & Construction

pw:\\FGDPRODPWV8.euro.iberdrola.local:UKRENEW\Documents\UK%20Offshore\3%20-%20PROJECTS\EA1%20Grid%20Package\03%20ONSHORE%20CABLE\02%20ENGINEERING%20DESIGN\01%20Technical%20Documentation\07%20GIS\01%20Drawings\

Appendix 1 Limitations

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between REC Ltd and the Client as indicated in Section 1.2.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. In addition to the above REC Ltd note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.

7. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

8. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

9. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

10. This report presents an interpretation of the geotechnical information established by excavation, observation and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that man made deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently there may be conditions present not revealed by this investigation.

11. REC can not be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by REC is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by REC in this connection without their explicit written agreement there to by REC.

12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

Appendix 2 Exploratory Hole Logs

Trial Pit Log

Borehole No. **TP01 - CH**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620301.84 Northing: 248357.99	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 28.81 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 06/06/2016 End Date: 06/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						28.81		Dark brown silty SAND. Sand is fine to coarse. Sand is fine to coarse. Rare rounded gravels of flint. [TOPSOIL]
		0.50 0.50	ES PID	PID=0	0.40	28.41		Light brown slightly silty SAND. Sand is fine to coarse. Rare rounded, fine to coarse gravels of flint. [KESGRAVE CATCHMENT SUBGROUP]
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

1 2 3 4 5

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Side collapse

Pit Dimensions (m)

Length:	1.80
Width:	0.90
Depth:	2.50

Trial Pit Log

Borehole No. **TP03 - CH**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620404.02 Northing: 248408.84	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 31.59 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 03/06/2016 End Date: 03/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						31.59		Dark brown silty SAND. Sand is fine to coarse. Occasional rounded, coarse gravels of flint. [Potentially reworked from archaeological activity]. [TOPSOIL]
					0.30	31.29		Pale yellow and orange, slightly gravelly SAND. Sand is coarse. Gravel is sub-angular to rounded, fine to coarse flint. [KESGRAVE CATCHMENT SUBGROUP]
		0.50 0.50	ES PID	PID=0				
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)

Length:	2.10
Width:	0.60
Depth:	2.50

Trial Pit Log

Borehole No.
TP04 - CH
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620476.46 Northing: 248411.82	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 27.41 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 03/06/2016 End Date: 03/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						27.41		Dark brown, slightly gravelly, silty SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint and rare fine chalk. Frequent rootlets. [TOPSOIL]
		0.50 0.50	ES PID	PID=0	0.40	27.01		Light brown, slightly gravelly, silty SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flints. [KESGRAVE CATCHMENT SUBGROUP]
		1.00 1.00	ES PID	PID=0				*… between 1.10mbgl and 2.50mbgl: SAND becomes pale yellow/orange.*
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)
Length: 2.30
Width: 0.60
Depth: 2.50

Trial Pit Log

Borehole No. **TP05 - CH**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620493.95 Northing: 248462.22	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 29.89 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 02/06/2016 End Date: 02/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						29.89		Dark brown, slightly silty SAND with occasional gravels of angular to sub-rounded, fine to coarse flint. Frequent rootlets. [TOPSOIL]
		0.40	PID	PID=0	0.40	29.49		Slightly clayey SAND. Sand is fine to medium. [KESGRAVE CATCHMENT SUBGROUP]
		0.50	ES					
		1.00	ES					
		1.00	PID	PID=0				
					1.20	28.69		Orange SAND. Sand is coarse. [KESGRAVE CATCHMENT SUBGROUP]
		1.50	ES					
		1.50	PID	PID=0				
					1.80	28.09		Orange SAND. Sand is fine to coarse. [KESGRAVE CATCHMENT SUBGROUP]
		2.00	ES					
		2.00	PID	PID=0				
					2.40	27.49		Finely laminated orange SAND and light brown clay. Sand is fine to medium. Rare laminations of weathered ironstone. [KESGRAVE CATCHMENT SUBGROUP]
		2.50	ES		2.50			End of Borehole at 2.50m
		2.50	PID	PID=0				

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)

Length:	2.20
Width:	0.60
Depth:	2.50

Trial Pit Log

Borehole No.
TP06 - CH
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620548.87 Northing: 248474.84	Hole Type TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 28.86 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 02/06/2016 End Date: 02/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						28.86		Dark brown, slightly gravelly, silty SAND. Sand is fine. Gravel is fine to coarse flint with rare sub-rounded, fine chalk. [TOPSOIL]
		0.50 0.50	ES PID	PID=0	0.50	28.36		Light brown slightly gravelly, silty SAND. Sand is fine. Gravel is angular to rounded, medium to coarse flint. [KESGRAVE CATCHMENT SUBGROUP]
		1.00 1.00	ES PID	PID=0	0.90	27.96		Light yellow SAND. Sand is coarse. [KESGRAVE CATCHMENT SUBGROUP]
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
								… at 2.30mbgl: thin laminations of red clay.
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Stable

Pit Dimensions (m)
Length: 2.20
Width: 0.60
Depth: 2.50

Trial Pit Log

Borehole No. **TP07 - CH**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620553.31 Northing: 248521.70	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 31.24 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 02/06/2016 End Date: 02/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
						31.24		Dark brown silty SAND with frequent rootlets and occasional rounded to sub-angular, fine to coarse flints. [TOPSOIL]
		0.40	PID	PID=0	0.40	30.84		
		0.50	ES					Light brown/yellow, slightly gravelly SAND. Sand is coarse. Gravel is rounded to angular, fine to coarse flints. [KESGRAVE CATCHMENT SUBGROUP]
		1.00	ES					
		1.00	PID	PID=0				
								… between 1.20mbgl and 2.50mbgl: no more flints present.
		1.50	ES					
		1.50	PID	PID=0				
		2.00	ES					
		2.00	PID	PID=0				
								… between 2.30mbgl and 2.50mbgl: SAND becomes orange.
		2.50	ES		2.50			
		2.50	PID	PID=0				End of Borehole at 2.50m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Slight caving

Pit Dimensions (m)

Length:	2.30
Width:	0.60
Depth:	2.50

Trial Pit Log

Borehole No. **TP08 - CH**

Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620611.49 Northing: 248556.12	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 28.83 Final Depth (m): 2.80	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 02/06/2016 End Date: 02/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						28.83		Soft dark brown silty SAND with occasional rootlets, and rounded to angular gravel of fine to coarse flints. Sand is fine to coarse. [TOPSOIL]
					0.30	28.53		Light brown/pale yellow SAND. Sand is coarse. [KESGRAVE CATCHMENT SUBGROUP]
		0.50 0.50	ES PID	PID=0				
		1.00 1.00	ES PID	PID=0				
		1.50 1.50	ES PID	PID=0				
		2.00 2.00	ES PID	PID=0				
		2.50 2.50	ES PID	PID=0				*… between 2.50mbgl and 2.80mbgl: slight orange veins present in SAND.*
					2.80			End of Borehole at 2.80m

Remarks:

Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Slight caving at 2.0mbgl.

Pit Dimensions (m)

Length:	2.20
Width:	0.60
Depth:	2.80

Trial Pit Log

Borehole No.
TP09 - CH
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620621.94 Northing: 248520.48	Hole Type: TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 27.59 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 03/06/2016 End Date: 03/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						27.59		Dark brown slightly clayey, silty SAND. Frequent rootlets throughout. Sand is fine to coarse. Occasional rounded gravels of fine to coarse flints. [TOPSOIL]
		0.50 0.50	ES PID	PID=0	0.50	27.09		Light brown silty SAND with occasional rounded flint gravels. Sand is fine to coarse. [KESGRAVE CATCHMENT SUBGROUP]
		1.00 1.00	ES PID	PID=0				
					1.20	26.39		Pale yellow, slightly gravelly SAND. Sand is coarse. Gravel is rounded, fine to coarse flint. [KESGRAVE CATCHMENT SUBGROUP]
		1.50 1.50	ES PID	PID=0	1.60	25.99		Orange, slightly silty SAND. Sand is fine to coarse. Occasional black sandy veins (no odour). Weathered between 2.10mbgl and 2.30mbgl. Rare veins of mudstone. [KESGRAVE CATCHMENT SUBGROUP]
		2.00 2.00	ES PID	PID=0				*… between 2.10mbgl and 2.30mbgl: SAND becomes weathered.*
		2.50 2.50	ES PID	PID=0	2.50			End of Borehole at 2.50m

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater not encountered. Hole backfilled with arisings.

Stability: Collapse from surface on northern edge.

Pit Dimensions (m)
Length: 2.60
Width: 1.10
Depth: 2.50

Trial Pit Log

Borehole No.
TP10 - CH
Sheet 1 of 1

Project Name:	East Anglia ONE Offshore Wind Farm - Onshore Cable Route	Proj. ID: 1CO101165	Easting: 620654.60 Northing: 248551.92	Hole Type TP
Location:	Clopton Road, Tuddenham St. Martin, Ipswich, Suffolk, IP6 9BY	Plant: 8 Tonne Tracked Excavator	Level (m AOD): 25.47 Final Depth (m): 2.50	Scale: 1:25
Client:	Iberdrola Engineering & Construction (IEC)	Crew: Holmes Plant and Construction Ltd	Start Date: 03/06/2016 End Date: 03/06/2016	REC Engineer: CT

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
						25.47		Dark brown, slightly gravelly silty SAND. Sand is fine to coarse. Gravel is rounded to sub-rounded, fine to coarse flint. [TOPSOIL]
		0.50 0.50	ES PID	PID=0	0.40	25.07		Brown silty SAND. Sand is fine to coarse. [KESGRAVE CATCHMENT SUBGROUP]
		1.00 1.00	ES PID	PID=0	0.90	24.57		Dark grey clayey SAND. Sand is fine to coarse. [KESGRAVE CATCHMENT SUBGROUP]
	▼				1.20	24.27		Pale brown, slightly silty, slightly gravelly SAND. Sand is coarse. Gravel is angular, fine flint with roots. [KESGRAVE CATCHMENT SUBGROUP] *... between 1.30mbgl and 1.40mbgl: black sandy CLAY.*
		1.50 1.50	ES PID	PID=0				
		2.00	PID	PID=0				
		2.50	PID	PID=0	2.50			End of Borehole at 2.50m

Remarks:
Location cleared for services using a Cable Avoidance Tool. Groundwater strike at 1.30mbgl. Hole backfilled with arisings.

Stability: Unstable

Pit Dimensions (m)
Length:
Width:
Depth: 2.50

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

Appendix 3 Laboratory Certificates

SCIENTIFIC ANALYSIS LABORATORIES
DELIVERING SCIENCE

Scientific Analysis Laboratories is a limited company registered in England and Wales (No 2514788) whose address is at Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

3 Crittall Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2RT
Tel : 01376 560120
Fax : 01376 552923

Report Number: 577812-1 CH

Date of Report: 19-Aug-2016

Customer: Resource Environmental Consultants Ltd
Environment House
Segensworth Business Centre
Segensworth Road (West)
Fareham
PO15 5RQ

Customer Contact: Miss Charlotte Toth

Customer Job Reference: 1CO101165
Customer Purchase Order: 001221
Customer Site Reference: Iberdrola
Date Job Received at SAL: 07-Jun-2016
Date Analysis Started: 22-Jun-2016
Date Analysis Completed: 30-Jun-2016

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with Section 25 of the SAL Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Claire Brown Crociquia
Customer Service Manager

Issued by :
Chelsea Entwistle
Project Management

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

				SAL Reference	**577812 011**	**577812 014**	**577812 027**	**577812 035**	**577812 038**
				Customer Sample Reference	**TP01-CH @ 0.5m**	**TP01-CH @ 2.0m**	**TP03-CH @ 1.0m**	**TP04-CH @ 0.5m**	**TP04-CH @ 2.0m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**03-JUN-2016**	**03-JUN-2016**	**03-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	**7**	**5**	**5**	**5**	**6**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.1**	<0.1
Chromium	T257	A40	0.5	mg/kg	**8.0**	**5.0**	**9.2**	**6.1**	**5.8**
Copper	T257	A40	2	mg/kg	**9**	**3**	**7**	**7**	**4**
Lead	T257	A40	2	mg/kg	**17**	**4**	**7**	**15**	**4**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**7.9**	**3.8**	**8.1**	**5.4**	**6.3**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**17**	**20**	**18**	**13**	**14**
Zinc	T257	A40	2	mg/kg	**32**	**12**	**22**	**26**	**12**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected
Chloride	T686	A40	2	mg/kg	**5**	**3**	**10**	**9**	**8**
pH	T7	A40			**7.2**	**7.5**	**7.7**	**7.4**	**7.9**
Soil Organic Matter	T287	A40	0.1	%	**1.1**	**0.2**	<0.1	**1.0**	<0.1
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	<0.01	<0.01	<0.01	<0.01	<0.01
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1	<1
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	<10	<10	<10
Moisture @105C	T162	AR	0.1	%	**8.1**	**7.6**	**10**	**5.8**	**3.7**
Retained on 2mm	T2	A40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Suite E

					SAL Reference	**577812 054**	**577812 056**	**577812 067**	**577812 078**
					Customer Sample Reference	**TP06-CH @ 1.0m**	**TP06-CH @ 2.0m**	**TP08-CH @ 0.5m**	**TP10-CH @ 1.0m**
					Date Sampled	**02-JUN-2016**	**02-JUN-2016**	**02-JUN-2016**	**03-JUN-2016**
					Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T257	A40	2	mg/kg	<2	**6**	**5**	**5**
Boron (water-soluble)	T82	A40	1	mg/kg	<1	<1	<1	<1
Cadmium	T257	A40	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Chromium	T257	A40	0.5	mg/kg	**3.3**	**7.0**	**6.1**	**11**
Copper	T257	A40	2	mg/kg	<2	**4**	**7**	**13**
Lead	T257	A40	2	mg/kg	**3**	**7**	**14**	**15**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**2.6**	**11**	**5.8**	**8.8**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3
Vanadium	T257	A40	0.1	mg/kg	**7.5**	**37**	**13**	**37**
Zinc	T257	A40	2	mg/kg	**7**	**13**	**27**	**28**
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected	Asbestos not detected
Chloride	T686	A40	2	mg/kg	**7**	**7**	**10**	**11**
pH	T7	A40			**8.2**	**8.4**	**7.9**	**7.6**
Soil Organic Matter	T287	A40	0.1	%	<0.1	<0.1	**1.2**	**1.1**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	<0.01	<0.01	<0.01	<0.01
Cyanide(Total)	T921	AR	1	mg/kg	<1	<1	<1	<1
Cyanide(free)	T921	AR	1	mg/kg	<1	<1	<1	<1
Phenols(Mono)	T921	AR	1	mg/kg	<1	<1	<1	<1
TPH (C10-C40)	T219	AR	10	mg/kg	<10	<10	<10	<10
Moisture @105C	T162	AR	0.1	%	**2.5**	**6.2**	**6.7**	**17**
Retained on 2mm	T2	A40	0.1	%	<0.1	**8.7**	**15.7**	**16.2**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

					SAL Reference	**577812 011**	**577812 014**	**577812 027**	**577812 035**	**577812 038**
					Customer Sample Reference	**TP01-CH @ 0.5m**	**TP01-CH @ 2.0m**	**TP03-CH @ 1.0m**	**TP04-CH @ 0.5m**	**TP04-CH @ 2.0m**
					Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**03-JUN-2016**	**03-JUN-2016**	**03-JUN-2016**
					Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE) (MCERTS)

				SAL Reference	**577812 054**	**577812 056**	**577812 067**	**577812 078**
				Customer Sample Reference	**TP06-CH @ 1.0m**	**TP06-CH @ 2.0m**	**TP08-CH @ 0.5m**	**TP10-CH @ 1.0m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**	**02-JUN-2016**	**03-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Naphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
PAH(total)	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**577812 011**	**577812 014**	**577812 027**	**577812 035**	**577812 038**
				Customer Sample Reference	**TP01-CH @ 0.5m**	**TP01-CH @ 2.0m**	**TP03-CH @ 1.0m**	**TP04-CH @ 0.5m**	**TP04-CH @ 2.0m**
				Date Sampled	**06-JUN-2016**	**06-JUN-2016**	**03-JUN-2016**	**03-JUN-2016**	**03-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2	<2

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Soil Analysed as Soil
TPH (CWG) with MTBE & BTEX SE

				SAL Reference	**577812 054**	**577812 056**	**577812 067**	**577812 078**
				Customer Sample Reference	**TP06-CH @ 1.0m**	**TP06-CH @ 2.0m**	**TP08-CH @ 0.5m**	**TP10-CH @ 1.0m**
				Date Sampled	**02-JUN-2016**	**02-JUN-2016**	**02-JUN-2016**	**03-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Benzene	T209	AR	10	µg/kg	<10	<10	<10	<10
EthylBenzene	T209	AR	10	µg/kg	<10	<10	<10	<10
M/P Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10
O Xylene	T209	AR	10	µg/kg	<10	<10	<10	<10
Toluene	T209	AR	10	µg/kg	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	<2	<2	<2	<2
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	<2	<2	<2	<2

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Leachate Suite

				SAL Reference	**577812 014**	**577812 038**	**577812 056**
				Customer Sample Reference	**TP01-CH @ 2.0m**	**TP04-CH @ 2.0m**	**TP06-CH @ 2.0m**
				Date Sampled	**06-JUN-2016**	**03-JUN-2016**	**02-JUN-2016**
				Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
As (Dissolved)	T281	10:1	0.0002	mg/l	**0.0043**	**0.0025**	**0.0037**
B (Dissolved)	T281	10:1	0.05	mg/l	<0.05	<0.05	<0.05
Cd (Dissolved)	T281	10:1	0.00002	mg/l	<0.00002	<0.00002	**0.00003**
Cr (Dissolved)	T281	10:1	0.001	mg/l	<0.001	<0.001	**0.004**
Cu (Dissolved)	T281	10:1	0.0005	mg/l	**0.0024**	**0.0015**	**0.0014**
Pb (Dissolved)	T281	10:1	0.0003	mg/l	**0.0011**	**0.0008**	**0.0013**
Hg (Dissolved)	T281	10:1	0.00005	mg/l	<0.00005	<0.00005	<0.00005
Ni (Dissolved)	T281	10:1	0.001	mg/l	**0.001**	<0.001	**0.001**
Se (Dissolved)	T281	10:1	0.0005	mg/l	<0.0005	<0.0005	<0.0005
Zn (Dissolved)	T281	10:1	0.002	mg/l	**0.009**	**0.006**	**0.006**
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	<0.05	**0.08**	**0.11**
Cyanide(Total)	T546	10:1	0.01	mg/l	<0.01	<0.01	<0.01
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	**3**	**1**	**2**
pH	T7	10:1			**6.9**	**7.0**	**7.1**
Chemical Oxygen Demand	T221	10:1	20	mg/l	**26**	**48**	**27**
Chloride	T686	10:1	1	mg/l	**1**	**1**	**2**
Nitrate	T686	10:1	0.5	mg/l	**0.9**	**1.1**	**1.0**
Nitrite	T686	10:1	0.1	mg/l	<0.1	<0.1	<0.1
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	<10	<10	<10
Phenols(Mono)	T546	10:1	0.02	mg/l	<0.02	<0.02	<0.02
Sulphate	T686	10:1	0.5	mg/l	<0.5	<0.5	**0.5**
TPH (C10-C40)	T219	10:1	20	µg/l	**160**	**200**	**150**

SAL Reference: 577812
Project Site: Iberdrola
Customer Reference: 1CO101165

Leachate Analysed as Water
Total and Speciated USEPA16 PAH (SE)

SAL Reference	**577812 014**	**577812 038**	**577812 056**
Customer Sample Reference	**TP01-CH @ 2.0m**	**TP04-CH @ 2.0m**	**TP06-CH @ 2.0m**
Date Sampled	**06-JUN-2016**	**03-JUN-2016**	**02-JUN-2016**
Type	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T149	10:1	0.01	µg/l	**0.02**	**0.04**	**0.02**
Acenaphthylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Acenaphthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Fluorene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Phenanthrene	T149	10:1	0.01	µg/l	**0.05**	**0.04**	**0.04**
Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Chrysene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	<0.01	<0.01	<0.01
PAH(total)	T149	10:1	0.01	µg/l	**0.06**	**0.08**	**0.06**

Index to symbols used in 577812-1 CH

Value	Description
AR	As Received
10:1	Leachate to BS EN 12457-2 (10:1)
A40	Assisted dried < 40C
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Limited
Retained on 2mm is removed before analysis
Reported results on as received samples are corrected to a 105 degree centigrade dry weight basis except Ammonia & TPH c5-c35 aromatic/aliphatic split

Method Index

Value	Description
T54	GC/MS (Headspace)
T649	ICP/OES (Calc)
T281	ICP/MS (Filtered)
T287	Calc TOC/0.58
T16	GC/MS
T219	GC/FID (SE)
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T2	Grav
T21	OX/IR
T162	Grav (1 Dec) (105 C)
T808	Calc (by EC)
T921	Colorimetry (CF) (MCERT)
T4	Colorimetry
T27	PLM
T209	GC/MS (Head Space)(MCERTS)
T686	Discrete Analyser
T245	ICP/OES (Aqua Regia Extraction)
T82	ICP/OES (Sim)

T149	GC/MS (SIR)
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T7	Probe
T264	Probe (Incubation Carbonaceous) (5 Days)
T221	Colorimetry (CE)
T546	Colorimetry (CF)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Arsenic	T257	A40	2	mg/kg	M	011,014,027,035,038,054,056,067,078
Boron (water-soluble)	T82	A40	1	mg/kg	N	011,014,027,035,038,054,056,067,078
Cadmium	T257	A40	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Chromium	T257	A40	0.5	mg/kg	M	011,014,027,035,038,054,056,067,078
Copper	T257	A40	2	mg/kg	M	011,014,027,035,038,054,056,067,078
Lead	T257	A40	2	mg/kg	M	011,014,027,035,038,054,056,067,078
Mercury	T245	A40	1.0	mg/kg	U	011,014,027,035,038,054,056,067,078
Nickel	T257	A40	0.5	mg/kg	M	011,014,027,035,038,054,056,067,078
Selenium	T257	A40	3	mg/kg	U	011,014,027,035,038,054,056,067,078
Vanadium	T257	A40	0.1	mg/kg	U	011,014,027,035,038,054,056,067,078
Zinc	T257	A40	2	mg/kg	M	011,014,027,035,038,054,056,067,078
Asbestos ID	T27	A40			SU	011,014,027,035,038,054,056,067,078
Chloride	T686	A40	2	mg/kg	N	011,014,027,035,038,054,056,067,078
pH	T7	A40			M	011,014,027,035,038,054,056,067,078
Soil Organic Matter	T287	A40	0.1	%	N	011,014,027,035,038,054,056,067,078
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	M	011,014,027,035,038,054,056,067,078
Cyanide(Total)	T921	AR	1	mg/kg	M	011,014,027,035,038,054,056,067,078
Cyanide(free)	T921	AR	1	mg/kg	M	011,014,027,035,038,054,056,067,078
Phenols(Mono)	T921	AR	1	mg/kg	M	011,014,027,035,038,054,056,067,078
TPH (C10-C40)	T219	AR	10	mg/kg	M	011,014,027,035,038,054,056,067,078
Moisture @105C	T162	AR	0.1	%	N	011,014,027,035,038,054,056,067,078
Retained on 2mm	T2	A40	0.1	%	N	011,014,027,035,038,054,056,067,078
Naphthalene	T16	AR	0.1	mg/kg	U	011,014,027,035,038,054,056,067,078
Acenaphthylene	T16	AR	0.1	mg/kg	U	011,014,027,035,038,054,056,067,078
Acenaphthene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Fluorene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Phenanthrene	T16	AR	0.1	mg/kg	U	011,014,027,035,038,054,056,067,078
Anthracene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Fluoranthene	T16	AR	0.1	mg/kg	N	011,014,027,035,038,054,056,067,078
Pyrene	T16	AR	0.1	mg/kg	N	011,014,027,035,038,054,056,067,078
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Chrysene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Benzo(b)fluoranthene	T16	AR	0.1	mg/kg	U	011,014,027,035,038,054,056,067,078
Benzo(k)fluoranthene	T16	AR	0.1	mg/kg	N	011,014,027,035,038,054,056,067,078
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	M	011,014,027,035,038,054,056,067,078
PAH(total)	T16	AR	0.1	mg/kg	U	011,014,027,035,038,054,056,067,078
Benzene	T209	AR	10	µg/kg	M	011,014,027,035,038,054,056,067,078
EthylBenzene	T209	AR	10	µg/kg	M	011,014,027,035,038,054,056,067,078
M/P Xylene	T209	AR	10	µg/kg	M	011,014,027,035,038,054,056,067,078
O Xylene	T209	AR	10	µg/kg	M	011,014,027,035,038,054,056,067,078
Toluene	T209	AR	10	µg/kg	M	011,014,027,035,038,054,056,067,078
Methyl tert-Butyl Ether	T209	AR	10	µg/kg	M	011,014,027,035,038,054,056,067,078
TPH (C5-C6 aliphatic)	T54	AR	0.10	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C6-C7 aromatic)	T54	AR	0.10	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C6-C8 aliphatic)	T54	AR	0.10	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C7-C8 aromatic)	T54	AR	0.10	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C8-C10 aliphatic)	T54	AR	0.10	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C8-C10 aromatic)	T54	AR	0.10	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C10-C12 aliphatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C10-C12 aromatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C12-C16 aliphatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C12-C16 aromatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C16-C21 aliphatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C16-C21 aromatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C21-C35 aliphatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
TPH (C21-C35 aromatic)	T219	AR	2	mg/kg	N	011,014,027,035,038,054,056,067,078
As (Dissolved)	T281	10:1	0.0002	mg/l	U	014,038,056

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
B (Dissolved)	T281	10:1	0.05	mg/l	U	014,038,056
Cd (Dissolved)	T281	10:1	0.00002	mg/l	U	014,038,056
Cr (Dissolved)	T281	10:1	0.001	mg/l	U	014,038,056
Cu (Dissolved)	T281	10:1	0.0005	mg/l	U	014,038,056
Pb (Dissolved)	T281	10:1	0.0003	mg/l	U	014,038,056
Hg (Dissolved)	T281	10:1	0.00005	mg/l	U	014,038,056
Ni (Dissolved)	T281	10:1	0.001	mg/l	U	014,038,056
Se (Dissolved)	T281	10:1	0.0005	mg/l	U	014,038,056
Zn (Dissolved)	T281	10:1	0.002	mg/l	U	014,038,056
Ammoniacal nitrogen	T686	10:1	0.05	mg/l	U	014,038,056
Cyanide(Total)	T546	10:1	0.01	mg/l	U	014,038,056
Biochemical Oxygen Demand (Allyl Thiourea)	T264	10:1	1	mg/l	N	014,038,056
Chemical Oxygen Demand	T221	10:1	20	mg/l	N	014,038,056
pH	T7	10:1			N	014,038,056
Chloride	T686	10:1	1	mg/l	U	014,038,056
Nitrate	T686	10:1	0.5	mg/l	U	014,038,056
Nitrite	T686	10:1	0.1	mg/l	U	014,038,056
Total Hardness expressed as CaCO3	T649	10:1	10	mg/l	U	014,038,056
Phenols(Mono)	T546	10:1	0.02	mg/l	U	014,038,056
Sulphate	T686	10:1	0.5	mg/l	U	014,038,056
TPH (C10-C40)	T219	10:1	20	µg/l	N	014,038,056
Naphthalene	T149	10:1	0.01	µg/l	N	014,038,056
Acenaphthylene	T149	10:1	0.01	µg/l	N	014,038,056
Acenaphthene	T149	10:1	0.01	µg/l	N	014,038,056
Fluorene	T149	10:1	0.01	µg/l	N	014,038,056
Phenanthrene	T149	10:1	0.01	µg/l	N	014,038,056
Anthracene	T149	10:1	0.01	µg/l	N	014,038,056
Fluoranthene	T149	10:1	0.01	µg/l	N	014,038,056
Pyrene	T149	10:1	0.01	µg/l	N	014,038,056
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	N	014,038,056
Chrysene	T149	10:1	0.01	µg/l	N	014,038,056
Benzo(b)fluoranthene	T149	10:1	0.01	µg/l	N	014,038,056
Benzo(k)fluoranthene	T149	10:1	0.01	µg/l	N	014,038,056
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	N	014,038,056
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	N	014,038,056
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	N	014,038,056
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	N	014,038,056
PAH(total)	T149	10:1	0.01	µg/l	N	014,038,056

Appendix 4 Photograph Appendix

TP01-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP03-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP04-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP05-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP06-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP07-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP08-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP09-CH

Long face

Short face

Spoil - topsoil

Spoil - sand

TP10-CH

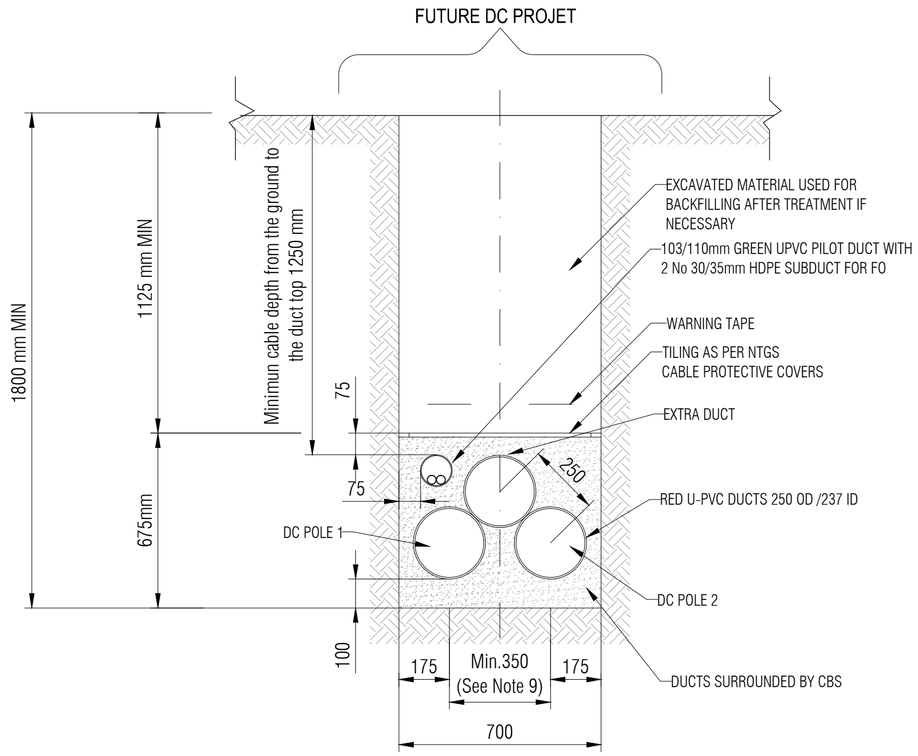
Long face

Short face

Spoil

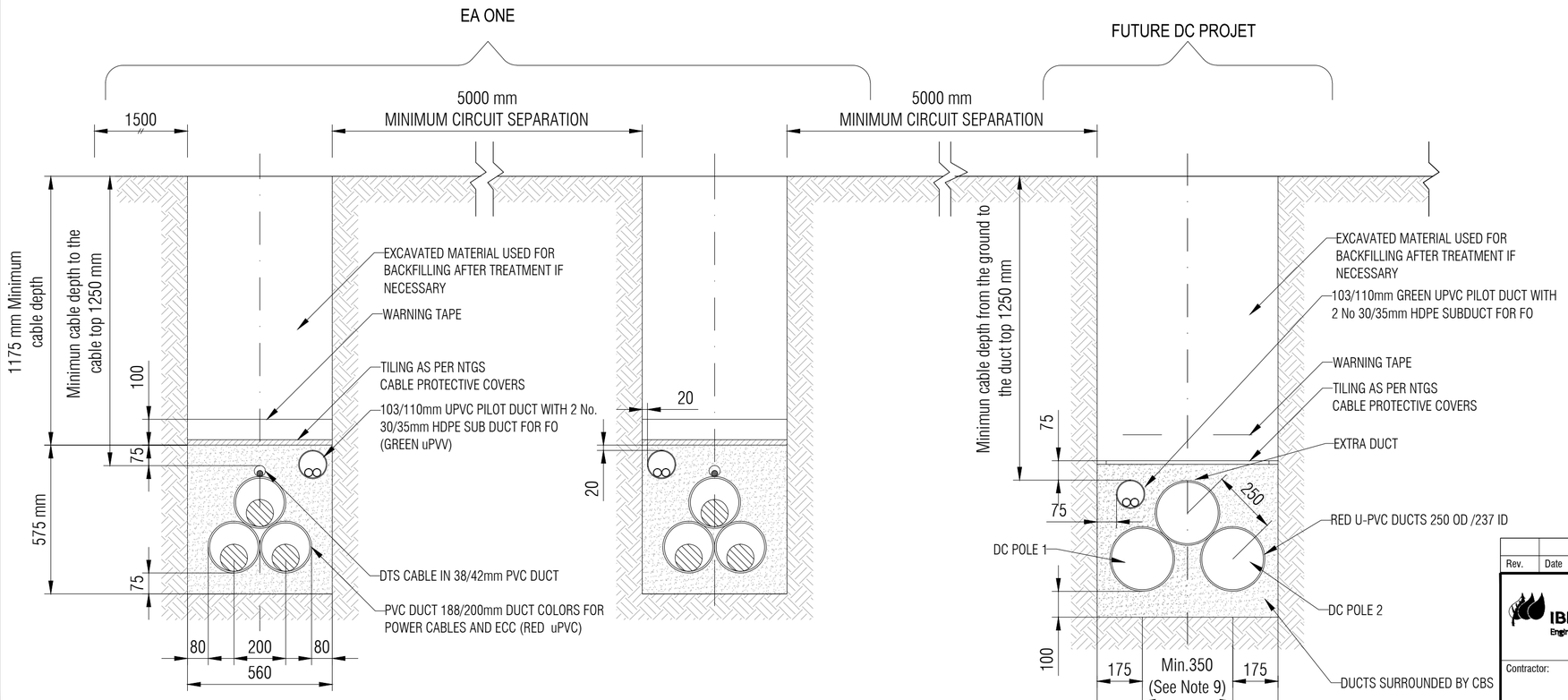
Water seepage

Appendix 4 Typical Cross Section of Cable Trench



NOTES:

1. MINIMUM TRENCH TURNING RADIUS = 8 METRES .
2. DURING THE DUCTS INSTALLATION A NYLON PILOT ROPE TO BE INSTALLED WITHIN THE POWER CABLES DUCTS FOR PULLING.
3. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH NGTS 3.10.
4. INSTALATION IN ACCORDANCE WITH NGTS 3.5.7.
5. CEMENT BOUND SAND TO ENA TS 97-1.
6. BASE OF EXCAVATION TO BE THOROUGHLY COMPACTED PRIOR TO THE CBS INSTALLING UP TO 3% OF CBR.
7. DUCTS TO BE IN ACCORDANCE WITH NGTS 3.5.7
8. PROTECTIVE COVERS AND WARNING TAPES TO ENA-TS 12-23.
9. WHERE INCREASED CABLE DEPTH IS REQUIRED, E.G. TO PASS BENEATH EXISTING SERVICES, MINIMUM AXIAL SPACING BETWEEN DC CIRCUITS TO BE INCREASED. THE CABLE DEPTHS AND SPACINGS LISTED IN THE TABLE APPLY ONLY WHEN THE CIRCUIT IS INSTALLLED AT GREATER DEPTHS TO AVOID DRAINAGE PIPES, TELEPHONE CABLES ETC. IF THE CIRCUIT IS CROSSING UNDER A HEAT SOURCE (I.E POWER CABLES OR STEAM PIPES) THEN IT MAY BE NECESSARY TO INCREASE THE CABLE SPACING FURTHER. EACH CASE MUST BE CONSIDERED INDIVIDUALLY.



DEPTH VS. SPACING VALUES FORESEEN FOR A 2500mm2 Cu ǂ 320kV CABLES DELIVERING 1,2 GW (1875 Amps)

DEPTH TO THE TOP OF THE CABLE (mm)	MINIMUM CIRCUIT SEPARATION (mm)
1250	350
1450	450
1650	600
1850	750
2050	900
2250	1100
2450	1350
2650	1600

Rev.	Date	Prepared	Reviewed	Approved	Reason / Description of changes.

IBERDROLA Engineering & Construction

Contractor:

Client: SCOTTISHPOWER RENEWABLES

Status Stamp:

Status Stamp:

Project: EAST ANGLIA

Location: BAWDSEY TO BRAMFORD

Drg. Title: TYPICAL CROSS SECTION OF DC CABLE TRENCH

Date of First Issue: 15/02/2016

Prepared	Reviewed	Approved
IMFE	GRAT	FERG

Drg. No.: EA1-GRD-D-IB-001302

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Sheet: 1 Next: - Rev: 0

Scale: 1:15 Size: A2