Note: Outline Planning Application (OPA) Site Boundary

The following report was produced prior to the finalisation of the application site boundary. The final application site boundary is shown on Figure 1.1 in ES Appendix 1.1. Therefore, references within the report to the site boundary do not reflect the site area and site boundary submitted with the OPA.

The reports were correct at the time of preparation, and all information within the Environmental Statement assessment reflects the latest relevant information.

OTTERPOOL PARK ENVIRONMENTAL STATEMENT

Appendix 10.1 - Ground Conditions Report

JANUARY 2019

Otterpool Park ES - Appendix 10.1 - Ground Conditions Report

Author	JR
Checker	AP
Approver	GF
Report No	OP_ARC_610_RP_EN_D01
Date	JANUARY 2019

VERSION CONTROL

Version	Date	Author	Changes
D01	08/01/2018	JR	First Draft
D02_RB	07/12/2018	JR	Updated with EIA PM review comments
D03	15/01/2019	JR	for client/Quod review
D04	24/01/2019	JR	Legal Review

This report dated 24 January 2019 has been prepared for Folkestone & Hythe District Council (the “Client”) in accordance with the terms and conditions of appointment dated 03 August 2016(the “Appointment”) between the Client and Arcadis Consulting (UK) Limited (“Arcadis”) for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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Arcadis	**5002-UA008926-UP31-S2-02**	**Potentially Contaminative Land Uses**
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ABBREVIATIONS

ACEC	Aggressive Chemical Environment for Concrete
ACM	Asbestos Containing Material
BGS	British Geological Survey
BH	Borehole
BTEX	Benzene, Toluene, Ethyl-benzene, Xylene
C4SL	Category 4 Screening Level
CBR	California Bearing Ratio
CIEH	Chartered Institute for Environmental Health
CL:AIRE	Contaminated Land: Applications in Real Environments
CoC	Contaminants of Concern
CSM	Conceptual Site Model
c_u	Undrained Shear Strength
CWG	Criteria Working Group
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency
EC	Equivalent Carbon band
EIA	Environmental Impact Assessment
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
EQS	Environmental Quality Standard
ES	Environmental Statement
FOC	Fraction of Organic Carbon
GAC	Generic Assessment Criteria
GCR	Geological Conservation Review site
GIR	Ground Investigation Report
GIS	Geographical Information System
GSV	Gas Screening Value
HDP	Hand Dug Pit
HGV	Heavy Goods Vehicle
LPG	Liquified Petroleum Gas
LQM	Land Quality Management Ltd.
m AOD	metres Above Ordnance Datum (Newlyn)
m bgl	metres below ground level
MFEM	Multi-Frequency Electromagnetic Sensor
MMP	Material Management Plan
MTBE	Methyl tert-butyl ether
NE	Natural England
OMC	Optimum Moisture Content
OS	Ordnance Survey
PAH	Polycyclic Aromatic Hydrocarbons
PBA	Peter Brett Associates
PCB	Polychlorinated Biphenols
PI	Plasticity Index
PID	Photo-Ionisation Detector
PNEC	Predicted No Effect Concentration
RAF	Royal Air Force
RIBA	Royal Institute of British Architects
S4UL	Suitable for Use Level
SDC	Shepway District Council
SNRHW	Stable Non-Reactive Hazardous Waste
SOM	Soil Organic Matter
SPT	Standard Penetration Test
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Urban Drainage Solutions.
SVOC	Semi-Volatile Organic Compounds
TCR	Total Core Recovery
TP	Trial Pit
TPH	Total Petroleum Hydrocarbons
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds
WAC	Waste Acceptance Criteria
WQS	Water Quality Standard
WS	Windowless Sampled borehole
WW2	World War Two

EXECUTIVE SUMMARY

Site Location	Otterpool Park is a proposed garden settlement located south of the M20 between Ashford and Folkestone in the Folkestone & Hythe District of Kent. This report accompanies an outline planning application by Otterpool Park LLP (the applicant) for a new garden settlement for up to 8,500 homes (use class C2 and C3) and use class D1, D2, A1, A2, A3, A4, B1a, B1b, B2, C1 development with related highways, green and blue infrastructure (access, appearance, landscaping, layout and scale matters to be reserved). The proposed development occupies 580 ha of predominantly agricultural land, between the villages of Lympne, Newingreen, Barrow Hill, Sellindge and Westenhanger. The Otterpool Park application site (“the site”) sits within a larger Framework Masterplan which proposes further expansion of the settlement to deliver 10,000 homes. The former Folkestone Racecourse sits within, and Westenhanger Castle and two industrial estates are located adjacent to, the Otterpool Park outline application site boundary.
Scope of works	This report provides a high-level review of the geotechnical and geo-environmental conditions at the site. The findings have identified potential development constraints and risks to inform the masterplan and can be used to refine further site investigation and development design during the detailed design stage. A preliminary ground investigation has been carried out which comprised 82 exploratory holes. The objectives were to obtain information on infiltration rates for the outline drainage strategy (reported in Otterpool Park ES Appendix 15.1), and inspect locations with greater potential for contamination to be present. Exploratory hole locations were selected to examine the geological formations present and assess geotechnical conditions encountered, or other ground-related observations.
Land Use (Current and Historic)	Several localised, potentially contaminative, land uses were identified: Otterpool Quarry (a former ragstone quarry, later a cement manufacturer and currently a lorry park) has known hydrocarbon soil impacts. A historical landfill (likely mostly inert materials) is located north of Lympne Industrial Park (HGV fuel storage and other industrial activities). The former Lympne Airport was active from 1916 to the 1970s with aircraft maintenance and wartime bombing recorded. Newingreen Industrial Estate (fuel storage), a vehicle maintenance garage and scrap vehicle storage are present along the A20. The south-eastern main line and Westenhanger Railway Station are located adjacent to the northern site boundary. A sewage pumping station and a motocross track are also present, along with small-scale waste and fuel storage facilities at the racecourse and industrial areas. Soil and groundwater samples were tested for contaminants potentially associated with the above sources during the recent ground investigation.
Geology, Hydrogeology & Hydrology	The site is situated north of the Hythe Escarpment, where the Hythe Formation (interbedded limestone and sandstone) overlies the older, less resilient Atherfield Clay and Weald Clay Formations. The bedrock strata dips slightly to the north and the younger Sandgate Formation (mudstone and siltstone) and Folkestone Formation (sandstone) overly the Hythe Formation in the northern part of the site. Mapped superficial deposits within the site include widespread Head Deposits (up to >4.6 m thick), and local Alluvium associated with the East Stour River, which drains the area to the northeast. Groundwater at the site is typically shallow and several springs are also present at Hythe Formation outcrops. The Hythe and Folkestone Formations are classified as Principal Aquifers by the Environment Agency, while the Sandgate Formation, Alluvium and a small proportion of the Head Deposits are classed as Secondary Aquifers. No active licenced groundwater or surface water abstractions are recorded within the site. Abstractions of <20 m^3/day do not require a licence and may be present, e.g. for agricultural purposes. The Hythe Formation has a history of quarrying in the area and the former Otterpool Quarry in the centre of the site is designated as a Geological SSSI.

Geo-environmental Analysis and Assessment	**Soil**	Risks to human health from contaminated soils have been assessed against Generic Assessment Criteria (GAC) for a ‘residential with plant uptake’ land use. This aligns with development for housing as the more sensitive end use. This receptor has been assumed across the whole site at this stage to provide a conservative assessment. A total of 78 soil samples were analysed, and the majority were below, i.e. compliant with, the GAC. Exceedances of GAC for PAH compounds were detected in TP113 at the lorry park and minor exceedances in three other locations. Lead was above the GAC at WS110 at Folkestone Racecourse and discrete asbestos fibres were detected in soils near the garage at the airport café and within the former airport.
	Controlled Waters	Fourteen groundwater samples were analysed to inform current baseline quality and potential risks to Controlled Waters. Most contaminant concentrations achieved, i.e. were below, conservative Water Quality Standards (WQS) for drinking water and environmental quality. The exception being minor exceedances for some heavy metals. These exceedances are not considered significant in the context of the proposed Development.
	Ground Gas	Gas monitoring was carried out at several borehole locations on three occasions including locations near the historical landfill, and the quarry backfill. Concentrations of methane (up to 0.1% v/v) and carbon dioxide (up to 4.7% v/v) and slight borehole flow were recorded. Gas screening values were calculated. Results were classed as ‘Green’ under the NHBC approach for low rise housing, and ‘Characteristic Situation 1’ under the modified Wilson and Card system. These early findings indicate the potential for ground gas generation is low and the associated hazard is low.
Soil Reuse and Management. Waste		Soil arisings from excavations during the development should be reused on site where they are suitable for reuse. This could be achieved by a Materials Management Plan (MMP) in accordance with the CL:AIRE Definition of Waste Code of Practice. Based on current findings, the majority of soils on site (if any were to become waste) are likely to classify as non-hazardous or inert, with potentially some hazardous material associated with the current lorry park. Topsoil from agricultural areas should be handled and stored appropriately and reused wherever possible.
Unexploded Ordnance (UXO)		UXO risks are associated with the historical RAF base. Pipe mines were laid beneath the runways, and an abandoned bomb is recorded in the northwest corner of the site. Undiscovered UXB or pipe mines would present a constraint to the development. The current masterplan includes residential housing in the north of the former airport. Significant additional investigation work will probably be required to mitigate the risk from UXO in this area.
Geotechnical Considerations		Shallow foundations are expected to be a suitable option for residential and other low-rise structures of moderate loading proposed at the site. However suitable precautions should be taken with respect to the presence of medium volume change potential cohesive material. Bedrock (Hythe Formation) is present at shallow depths in the centre of the site, which may cause difficult excavation conditions, such as for service trenches and foundations. Generally, groundwater inflows into exploratory holes were not substantial, but some groundwater control may be required generally, and perhaps more so in lower lying areas in the centre and north of the site where shallow groundwater is present.

Conclusions and recommendations	No development-critical issues have been identified that may significantly impact the development feasibility. Detailed ground investigation and in-situ assessment of geotechnical factors such as bearing capacity and settlement should be conducted at higher density prior to each development phase. Additional checks for chemical quality of soils and topsoil for reuse and for as yet undiscovered contamination, particularly near the historical landfill and former quarry (potential gas source), should also be included. An MMP is recommended to manage the sustainable use of soil arisings. A UXO risk mitigation plan should be prepared for any development in the medium and high-risk areas. Additional assessment / investigation to inform the potential options for protecting and enhancing the geological SSSI site as part of the Development is recommended at the detailed design stage.

1 INTRODUCTION

1.1 Terms of Reference

Arcadis Consulting (UK) Limited (Arcadis) received instructions from Otterpool Park LLP (formerly Folkestone & Hythe District Council (FHDC) and Cozumel Estates) (the applicant) to undertake a preliminary ground investigation and initial assessment of ground conditions for the proposed Otterpool Park Development ("the site"). This report accompanies an outline planning application by the applicant for a new garden settlement for up to 8,500 homes (use class C2 and C3) and use class D1, D2, A1, A2, A3, A4, B1a, B1b, B2, C1 development with related highways, green and blue infrastructure (access, appearance, landscaping, layout and scale matters to be reserved), referred to as the proposed Development. The proposed Development forms part of a larger Framework Masterplan which proposes further expansion of the garden settlement to deliver 10,000 homes and associated uses.

A RIBA Stage 1 Feasibility report was commissioned by FHDC (then Shepway District Council) in 2016 [1], and concluded (on the basis of the then available information) that there were "no significant [technical] barriers to development of a garden settlement which would preclude delivering the aspirations defined by the vision, aims and principles".

The Feasibility report recommended preliminary (Stage 2) investigation works including an intrusive ground investigation to obtain baseline information on potential contamination sources and soil infiltration rates for outline drainage design.

An initial phase of Ground Investigation across the wider Framework Masterplan site was carried out by Arcadis in August 2017 and the results were described and assessed in the interim release of this report in January 2018.

OPM(P)1016KA second phase of ground investigation was undertaken by Arcadis in August/September 2018. The Phase 2 ground investigation objectives were to investigate ground conditions in additional built development areas in the south of the site and to obtain additional information on drainage characteristics for the site.

This report should be read with in conjunction with the Chapter 10 [2],) Geology, Hydrogeology and Land Quality of the Otterpool Park Environmental Statement (ES.

This report should be read in conjunction with the Phase 1 and Phase 2 Ground Investigation Factual Reports for Otterpool Park (Ref. UA008926-43-AFS-GLR-G001 and 10011914-AFS-GLR-G001) provided as Appendix A and Appendix B.

1.2 Objectives

The purpose of this report is to provide a high-level review of the engineering and geo-environmental characteristics of the ground across the Framework Masterplan area to highlight major potential constraints to the proposed masterplan. The preliminary ground investigation carried out by Arcadis had two objectives: to identify significant areas of soil or groundwater contamination, and to obtain data on soil infiltration rates to inform the outline drainage strategy (Section 7.1). The latter is reported under separate cover [3].

Early identification of ground-related risks will enable the development team to optimise the outline design for the development, avoid unexpected financial or programme impacts later in the development process arising from unforeseen ground conditions and minimise required remediation.

This report supports the Otterpool Park Environmental Statement which considers both the impacts of the outline planning application for Otterpool Park, as well as the wider Framework Masterplan.

It should be noted that this is a preliminary investigation that has utilised relatively few exploratory hole locations, that are thus widely spaced, but are considered to be appropriate for a robust assessment of ground conditions at the outline planning application stage. Further, more detailed, investigation will be required, e.g. once outline planning permission has been approved, to help inform detailed design and further understand ground and land quality conditions and variations within.

However, undertaking a basic level of investigation at this stage provides useful information for the scheme both for the outline design and cost estimation.

1.3 Scope of Work

This report presents the results of the preliminary ground investigation in terms of the geotechnical and geo-environmental conceptual models for the masterplan phase of the development.

The scope of work has included the following tasks, which are presented in the sections listed below:

a) Collation and review of baseline information for the site, including the geology, hydrogeology and hydrology (Section 3);

b) A site walkover survey to identify features of geotechnical or geoenvironmental interest (Section 2.2);

c) Identification of current and historical potentially contaminative land uses on and near to the site (Section 4);

d) Regulatory enquires and detailed research into historical land uses including quarrying and wartime activities (Section 5);

e) Development of an outline Conceptual Site Model (CSM) and identification of potential contaminant linkages; (Section 6);

f) Two phases of preliminary intrusive investigation were undertaken to provide outline information on the site geology and hydrogeology, and baseline data on soil and groundwater quality and ground gas. (Section 7);

g) Screening of soil, groundwater and ground gas data against generic quantitative screening criteria (Sections 8, 9 and 10);

h) Preliminary waste classification of soils and recommendations for sustainable soil materials management (Section 11);

i) Identification of potential geotechnical constraints in relation to the proposed future use of the site; (Section12); and

j) Discussion of the resulting implications for the masterplan and recommendations for further work (Section 13).

1.4 Proposed Development

Otterpool Park is a proposed new garden settlement accommodating up to 8,500 homes (use class C2 and C3) and use class D1, D2, A1, A2, A3, A4, B1a, B1b, B2, C1 development with related highways, green and blue infrastructure (access, appearance, landscaping, layout and scale matters to be reserved).

Folkestone & Hythe District Council has set out a vision of Otterpool Park as a sustainable settlement with a mix of various residential dwellings types, employment areas, schools and local high street amenities. New transport and utility links and green infrastructure are also proposed.

This report is based on the proposed Development as represented by the planning application parameter plans for approval and Development SpecificationOPM(P)1016K which include:

- low to medium density residential housing located around Barrow Hill, Sellindge and Otterpool Lane in the west and south of the site;
- medium to high density residential housing located around the existing racecourse area and south of the A20 west of Newingreen;
- mixed light industrial/commercial development located around Westenhanger Castle in the northeast of the site;
- SUDS features such as drainage and attenuation areas located around the East Stour River north of the A20;
- 5 No. new Primary and 1 No. new Secondary Schools;

- Roads and public services associated with the above; and
- Allotments, location unconfirmed but proposed in the Feasibility Report [1].

The proposed layout is shown in Figure 1 (taken from Farrells drawing Ref. OPM(P)1016K, Rev. V 30-04-18). The final layout and details such as dwelling types (housing, apartments), private gardens, number of storeys, etc. are still to be confirmed and as such may affect the conclusions of this assessment. This report has therefore assumed a sensitive land use scenario may occur within all areas, with regards to the various ground risks considered.

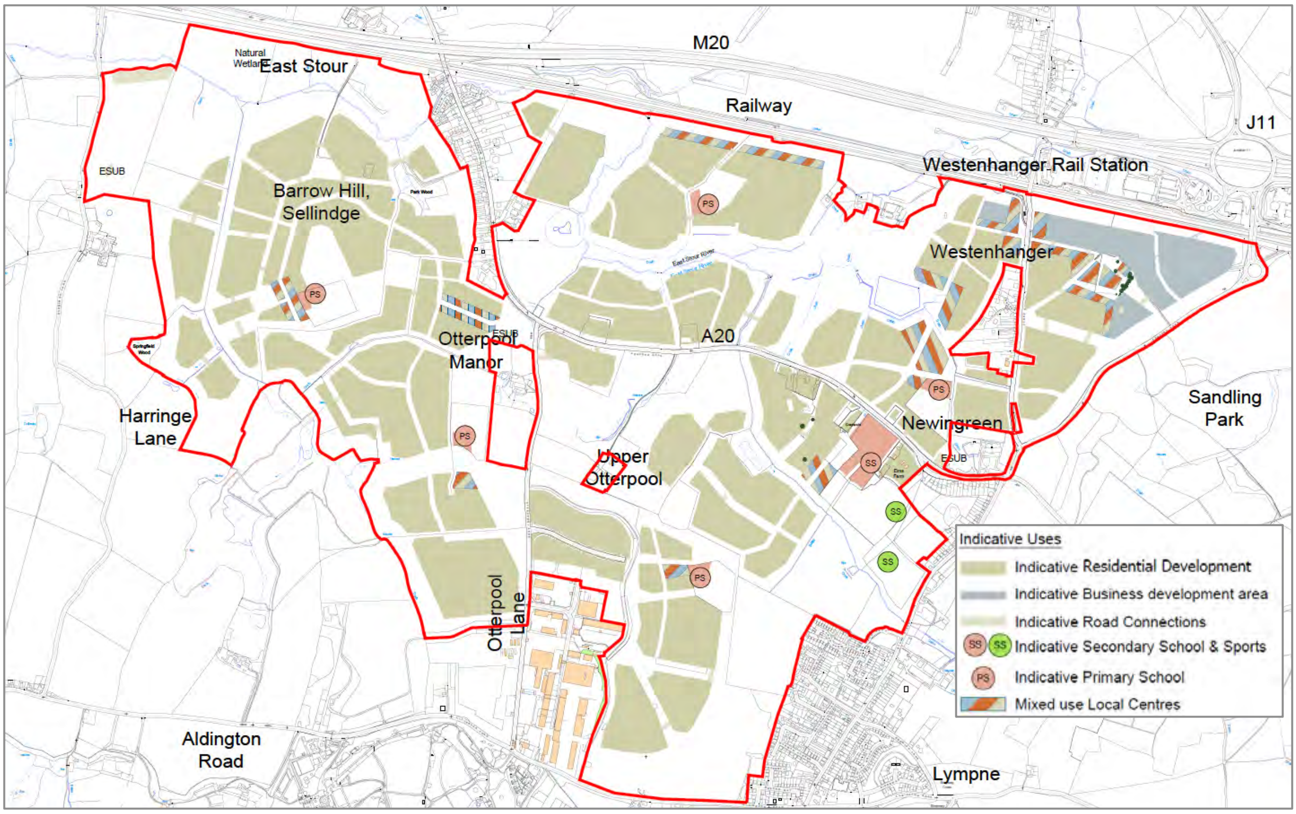


Figure 1 – Proposed Otterpool Park Development *(from Drawing Ref. OPM(P)1016K, Rev. K 17-12-18)*
Red line: planning application site boundary

1.5 Limitations

This report has been compiled from a number of sources, which Arcadis believes to be trustworthy. However, Arcadis is unable to guarantee the accuracy of information provided by others. The report is based on information available at the time. Consequently, there is a potential for further information to become available, which may change this report's conclusions and for which Arcadis cannot be responsible.

The approach adopted by Arcadis for the assessment of contamination at the site is based on critical evaluation of the methodologies currently available, to decide which are most applicable to the site conditions and proposed end-use. Guidance in land contamination is in a transitional state. Therefore, no responsibility can be accepted for future changes in legislation or guidance, which may affect the approach used or the findings of this report.

Arcadis do not accept liability for any use of the information presented in this report unless it is signed by the author, checker and approver and marked as final

A preliminary investigation has been carried out to help inform outline design concepts. Exploratory hole locations are widely spaced. It is not suitable for detailed design. It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, tidal, seasonal, climatic variations and those recorded in this report are dependent on the time the ground investigation was carried out and the weather before and during the investigation.

2 SITE INFORMATION

2.1 Site Location

The proposed Otterpool Park Development site is located in the west of Shepway District. It comprises a 580 ha area of land south of the M20 motorway between Ashford and Folkestone in Kent, southeast England. The red line boundary of the site (at the time of writing) has a perimeter of 16.6 km and is shown on Drawing Ref. *OPM(P)1016K, Rev. K 17-12-18* and Figure 3 below.

The nearest town is Hythe, located approximately 3.5 km to the east. The coastline of the English Channel is approximately 2.8 km to the southeast.

The site area is split between the TN postcode area in the north and west and the CT postcode area in the south. The approximate centre of the site is at National Grid Reference 611240, 136720 (nearest postcode is TN25 6DA).

The Site Location Plan (Drawing 0001) shows the site's location relative to surrounding settlements and major transport links.

2.2 Site Description

This section presents an overview of the planning application site (Figure 2) based on online and Ordnance Survey (OS) mapping [4], [5], [6], and a walkover survey carried out by Arcadis on 6th October 2016. Further information on the history of the site features is given in Section 4.

The wider Framework Masterplan area incorporates additional land to the north, east south and west of the site, notably including the Lympne Industrial park and the settlements of Barrowhill, Newingreen and Westenhanger (Figure 2).

2.2.1 Overview

The planning application site is an irregular shape measuring approximately 4.3 km east to west and 2.5 km north to south. The northern boundary of the site is adjacent to the railway (South-eastern Main Line), but excludes the village of Barrowhill and the area around Westenhanger Castle. The eastern boundary runs partly along the A20 in the north and Stone Street to the south. The southern boundary follows Aldington Road between Lympne village and Lympne Industrial Park, and the western boundary borders Harringe Brooks Wood and Harringe Lane.

Several settlements are adjacent to the planning application boundary. Westenhanger, including the railway station and the 14th Century Westenhanger Castle and a small number of low-density residential buildings is located in the northeast of the site. Lympne village is located adjacent to the southeast of the site. Barrow Hill, Sellindge and Newingreen are small residential settlements to the northwest and east of the site respectively.

Lympne Industrial Park (of approximately 30 ha in area) is located adjacent to the south of the site (further details in Section 4.1) and Newingreen Industrial Estate (approximately 0.8 ha in area) is located outside of the site boundary in the west of the site.

The north of the site includes the former Folkestone Racecourse. Several farms are located within the site including Somerfield Court Farm, Hillhurst Farm and Newingreen Farm. Otterpool Manor Farm is excluded from the site boundary in an inlier in the centre of the site. Other inliers excluded from the planning application site are Upper Otterpool and the houses in Westenhanger. Much of the site is currently in agricultural use for arable crops and livestock.

Major roads crossing the site include the A20 Ashford Road between Newingreen and Barrowhill, the B2067 Otterpool Lane, and Stone Street past Westenhanger [6] (Figure 2 and Drawing 0001).

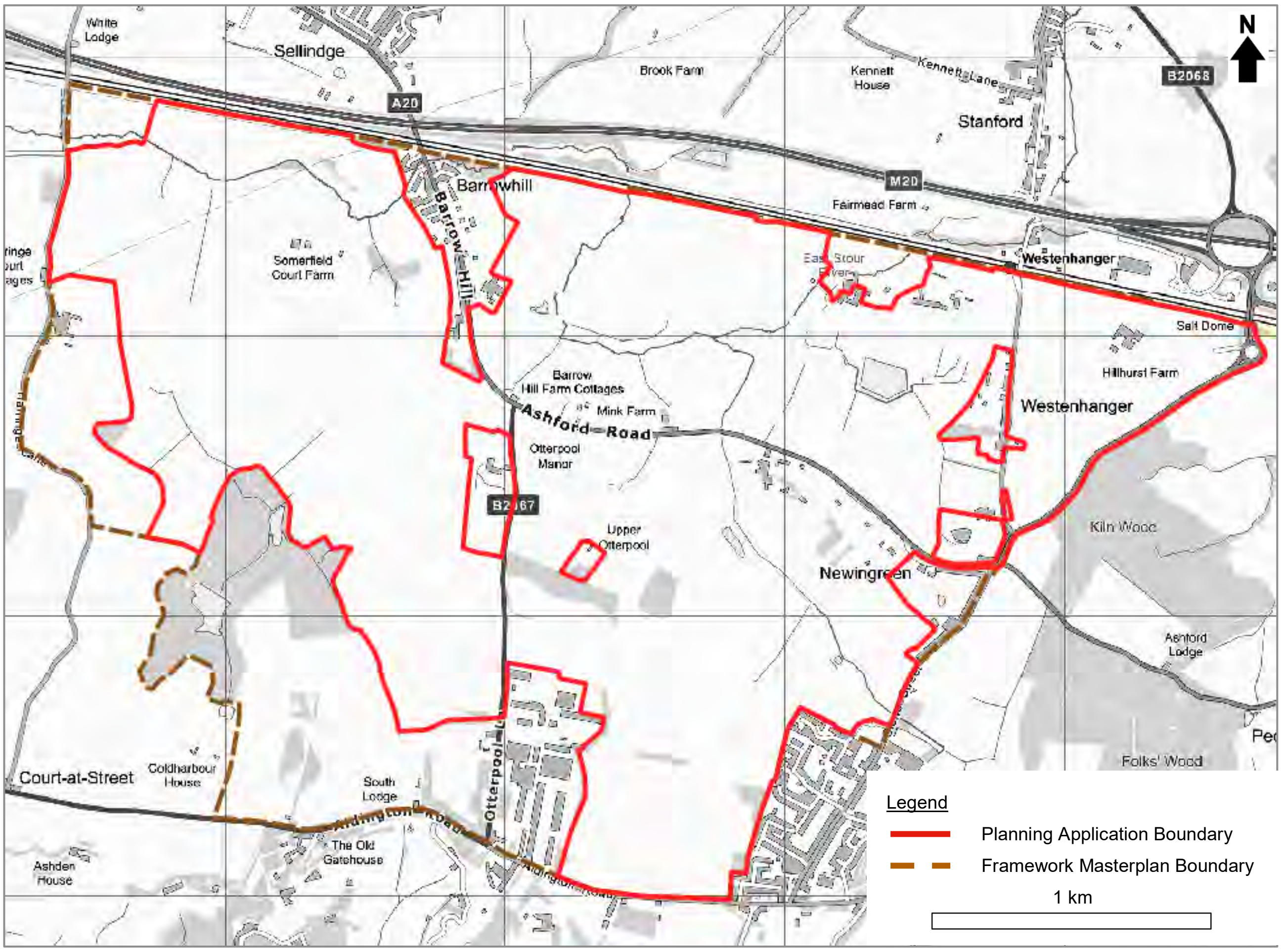


Figure 2 – Planning Application Site and Framework Masterplan Boundaries

2.2.2 Geo-Environmental Walkover Survey

A site walkover survey was carried out by an Arcadis Environmental Consultant on 6th October 2016. This survey covered the area outlined in purple in Figure 3. The findings of the survey are summarised as areas 1 to 3, shown in Figure 3 below. Relevant features are shown on Drawing 5002 and photographs are presented in Appendix C.

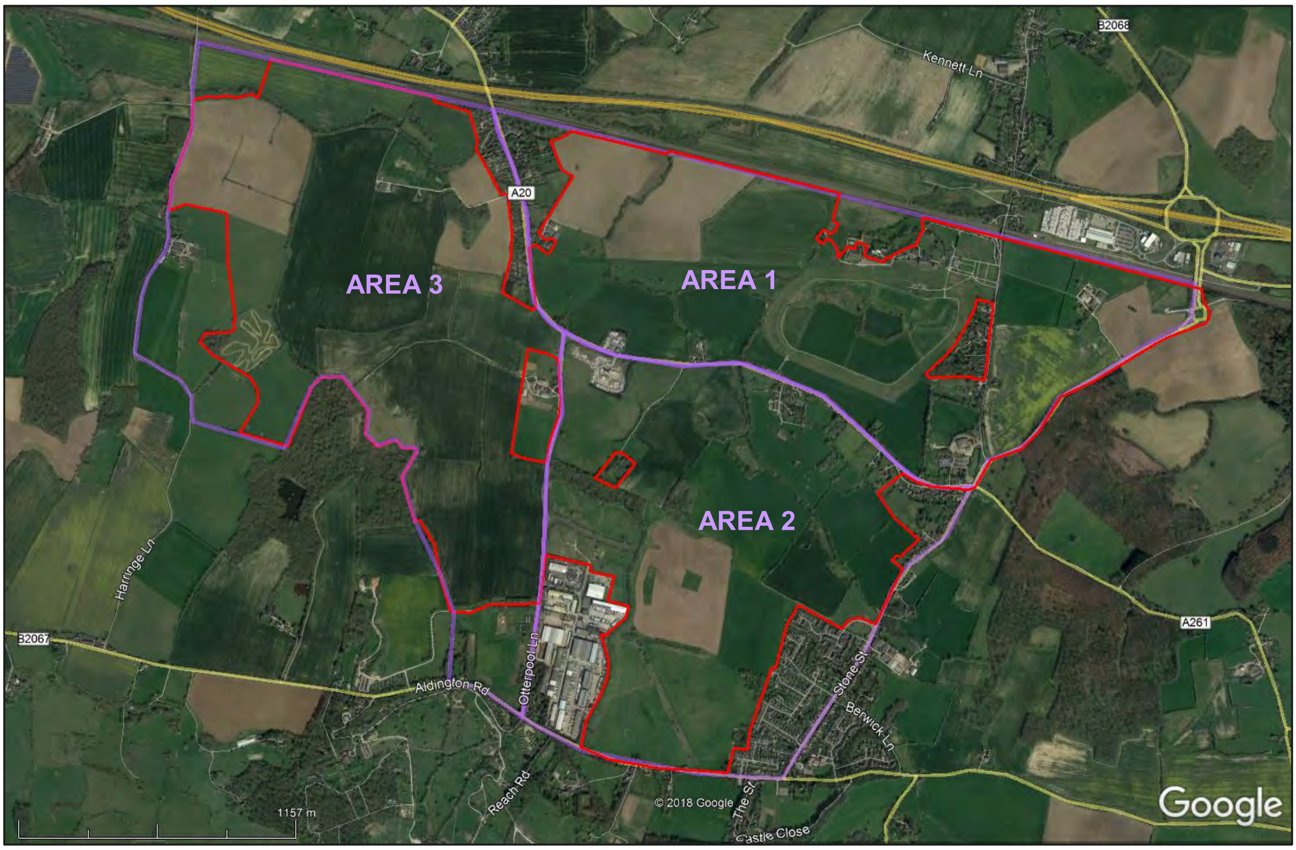


Figure 3 – Aerial View of Otterpool Park and Walkover Survey Areas 1-3 *(Modified from Google Earth Pro®, image date 04/09/2017)*

<u>Area 1: Folkestone Race Course and Westenhanger Castle</u>

- Folkestone Racecourse is currently disused. Recent uses include the annual War and Peace Revival Show between 2013 and 2016 [7]. The site contact stated that racecourse was used as a decoy airport during WW2 (RAF Westenhanger) and the racetrack used to be irrigated via a ring pipe around the course which is now disused.
- The walkover survey covered whole of racecourse and castle grounds. The racecourse comprised a turfed former horseracing track, former stable buildings, grandstand and ancillary buildings. A large central pond receives surface water from the racecourse. No visible indications of poor water quality were observed in any watercourse.
- Overhead electrical cable & transformers were noted around the stable buildings.
- 2 No. plastic fuel tanks, 1 No. metal gas cylinder tank, and 1No. electrical substation were located between the grandstand and the stables. A waste/bulk materials storage area was adjacent with two U-shaped wooden retaining walls and hardstanding in poor condition. No indications of any leaks/spills were seen.
- Westenhanger Castle comprises the castle building, a barn and several smaller buildings. It is now used as a conference/events centre. No significant features were seen in this area.
- A pumping station is marked on the OS map. A concrete plinth with a pipe possibly associated with the pumping station was observed west of the track, apparently backfilled with rubble. An abandoned car was also observed in this area.
- Areas of damp/waterlogged ground were noted to the north of the racecourse straight.
- A small vehicle repair yard (Arena Autos) was located north of the Airport Café in the southwest of Area 1. The hardstanding was generally of poor condition where present. Possible scrap vehicle storage at Mink Farm to the east of Arena Autos was also observed.

- A small industrial estate (Newingreen) (current use unknown) was visited in the southeast of Area 1. An above ground storage tank (likely fuel) was observed to the west of the main building.
- An above ground LPG tank was observed at Crosskeys in Newingreen on the corner of Ashford Road and Stone Street.

Area 2: Lympne Industrial Park, former workings, and former RAF base (Lympne Airport)

- **Lympne Industrial Park.** Operational businesses were observed to include:
  - Volvo truck and bus garage (MOT/VOSA tests),
  - Sico Europe (4 No. large outside gas storage tanks),
  - Coolfruit (refrigerated warehousing and shipping),
  - Truck wash and refuelling centre (DERV storage tanks and pumps, truck wash-down area, hardstanding in good condition, drainage unknown),
  - Steel storage/fabrication businesses,
  - Other haulage and warehouse enterprises,
  - Skips, an electrical substation, and 2 No. external gas storage tanks were seen in the southwest corner of the industrial estate. Hardstanding was in a moderately good condition, with no visible evidence of leaks or spillage,
  - The industrial park was bordered in the east by large (>2 m high) soil bunds.
- **Unused land to the north of Lympne Industrial Park** – an access road from Otterpool Lane appeared to be maintained but the area to south of the road shows existing buildings may have been demolished, and the area to the north appeared undeveloped (historical landfill – Section 5.2). There were 2 No. large stockpiles of soil to the north and south of the road.
- Residential streets of Lympne village in southeast were observed from a vehicle. A small electrical substation was present. The village of Newingreen in the northeast of the area was also visited, a possible above ground LPG fuel storage tank was visible from the road.
- **A former quarry (Otterpool Quarry)** is in the northwest of Area 2. Part of this was grassed (SSSI area, see Section 3.1.1) and the part next to the A20 is used as a lorry park. A couple of temporary cabins were present. No hardstanding was present, and evidence of fuel and oil spills was observed on the ground surface. Some small stockpiles of waste hardcore, soil and other materials were seen in the northwest of this area.
- **A former RAF base (RAF Lympne)** is located on land now occupied by Lympne Industrial Park and the area of grassland/green space to the east.
  - The area to the east of the industrial park was mostly mown grass with some areas of trees alongside the former runways.
  - Concrete hardstanding associated with the former taxiway and runway was visible, broken and scattered in places.
  - Several large bunds up to 3 or 4 m high were located along the east edge of the industrial park.
  - An overgrown area in the east of the airport contained disused hardstanding and former building footings (location of former rifle range, se Section 4.1).

Area 3: West

- Derelict single storey brick buildings were observed west of the B2067 opposite the industrial park, associated with the former airport (Section 4). Debris and rubbish were seen in the buildings, including a ruined truck.
- An off-road bike (motocross) race track was located in the west of the site.
- Gas storage tanks were observed outside Harringe Court off Harringe Lane to the west of the site.

2.3 Topography and Geomorphology

The site is at an elevation of 106 m AOD at its highest point on the south boundary, and slopes down to an elevation of 65 m AOD in the northwest, and 75 m AOD in the northeast corner. The average gradient over the majority of the site is 1 in 68 (0.015) sloping down towards the north. The topography within the site is generally subtle and dominated by the East Stour River in the north, which drains the site to the northwest (Figure 4). Areas of elevated terrain are shown in the south, at Westenhanger in the east and Somerfield Court Farm in the west.

The site is situated on the crest of the Greensand Ridge (Hythe Escarpment). This escarpment runs along part of the southern site boundary above Romney Marsh, and formed the original coastline before c.1,500 AD. The ridge is formed where the Hythe Formation overlies the less resistant Atherfield and Weald Clay Formations. These weaker materials are prone to instability and landslip; mass movement deposits are shown on the geological map (Drawing 0002). The crest of the slope is adjacent to the site boundary in the southeast and approximately 340 m from the site boundary in the southwest.

The wider area slopes down to the north as part of the northeast facing dip slope of the Lower Greensand Group, within the Miocene-age Wealden Anticline. To the north is the Vale of Holmesdale which rises up into the North Downs, approximately 2.3 km from the site.

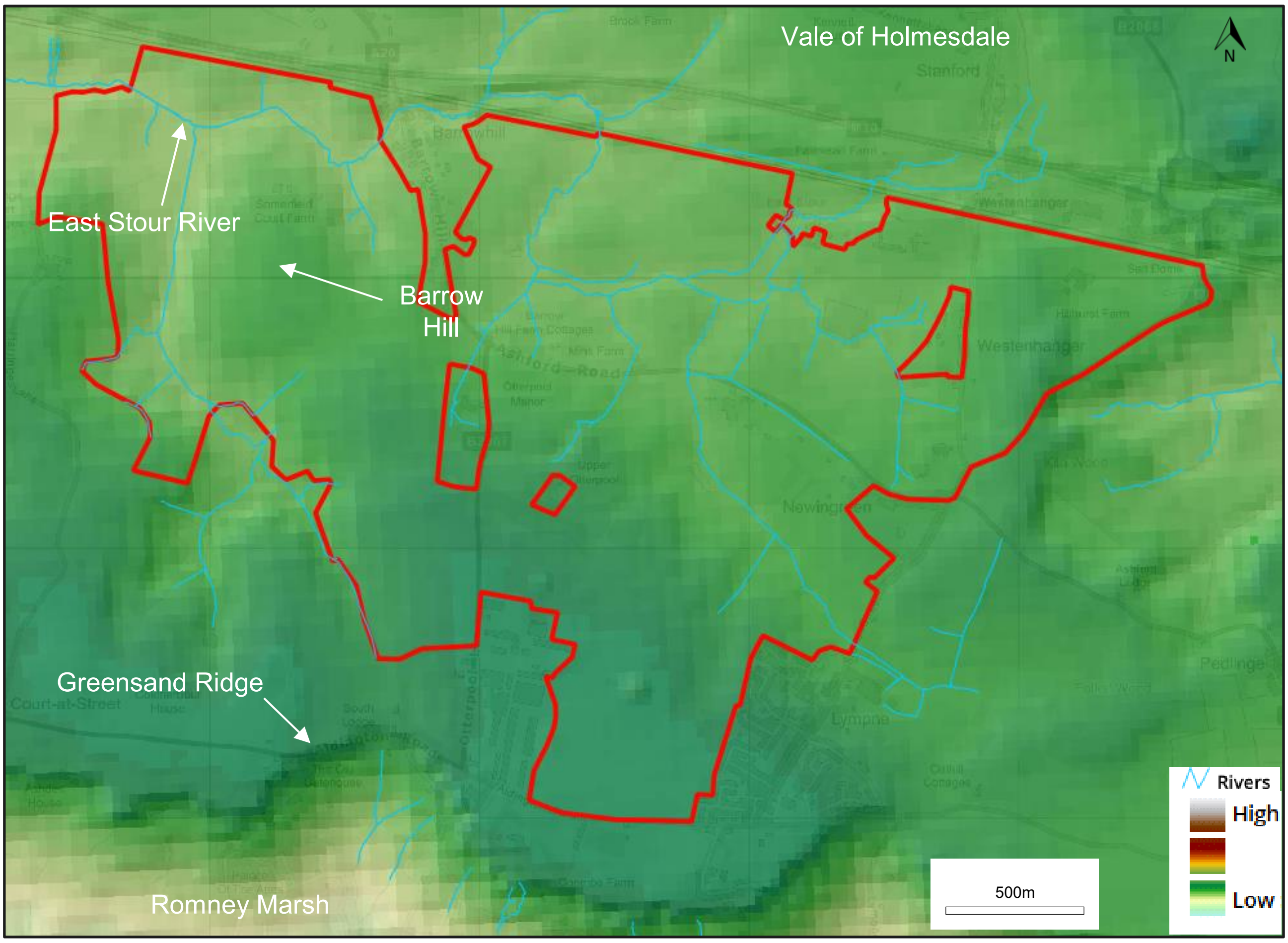


*Figure 4 – **Digital Terrain Model of Otterpool Park and Surrounding Area** (Contains British Geological Survey materials © NERC 2017)*

2.4 Surrounding Land Uses

Current land use within 1 km surrounding the site is described clockwise from the north based on OS mapping [6], online sources [5], [8], and the site walkover (Section 2.2.2). All distances are approximate to the red line boundary in Drawing 5002.

North

- The village of Sellindge is located 250 m to the north of the site, the land uses in this area are predominantly low-density residential and agricultural. The village of Barrowhill is adjacent to the north of the site.
- The South-Eastern Main Line railway forms the northern boundary of the site. This stretch of electrified running line is on embankment with road underbridges at Harringe Lane and Barrowhill and overbridges at Westenhanger and the A20. Three stream culverts also run under the railway along the site boundary.
- Beyond the railway and roughly parallel is the M20 motorway; Junction 11 is located 250 m to the northwest on large slip embankments. The Stop24 Junction 11 Motorway Services (opened 2007) are located 65 m to the north. The services comprise a petrol filling station, car and lorry parks and retail units.
- Land used as a highways depot is located 100 m northeast of the site, various maps indicate that road salt is stored here,
- High voltage electricity lines run on metal pylons for 1.2 km across the northwest corner of the site.

East

- The land to the east is dominated by agricultural fields and areas of woodland including Sandling Park and Kiln Wood. The nearest residential properties are in Lympne village adjacent to the site and in Sandling 950 m to the east comprising predominantly low-rise housing.
- Berwick Manor Farm and the Saxon Shore Way footpath are located around Lympne village to the southeast of the site. A primary school is 40 m southeast of the site.

South

- The area to the south of the site comprises sporadic residential houses and fields. Lympne Castle and its grounds are located south of Lympne village. Lympne Place (care home) is located 290 m to the south, and part of the Port Lympne Zoo Park is adjacent to the site beyond the B2067/Adlington Road in the southwest.
- The ground slopes steeply down to the south along the Hythe Escarpment; the slope crest is between 340m south of the site boundary in the southeast and adjacent to the site boundary in the southwest.

West

- The land to the west of Otterpool Park is predominantly arable fields with some small areas of woodland.
- A couple of small ponds and a spring are shown in Harringe Brook Woods immediately west of the site. Several other streams rise on the opposite side of the hill from the site and flow westwards.

3 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

3.1 Published Geology

The bedrock underlying the site, as shown on the geological map [9], comprises several units of the Lower Greensand Group. In descending stratigraphical order, and hence increasing age, these are: the Folkestone Formation, Sandgate Formation, Hythe Formation and Atherfield Clay Formation. Underlying these is the Weald Clay of the Wealden Group. The bedrock strata at the site dip gently northwards as part of the regional east-west trending anticlinal structure.

Table 1 and Table 2 summarise the geological units at the site and their published generic descriptions [10], [11].

Table 1 Summary of Published Superficial Geology

Period - Age	Strata	Generic Description	Extents
Quaternary	**Alluvium**	Clay, Silt, Sand and Gravel Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.	Follows the course of the East Stour River and its tributaries in the north and east of the site, (outcrop 5% of site area).
Quaternary	**Head Deposits**	Clay and Silt. Poorly sorted and poorly stratified detrital material formed by subaerial slope processes (solifluction and/or hillwash and soil creep) in layers and fans. (Hillhurst Farm (northeast corner of site) only - Clay, Silt, Sand and Gravel Named 'Head Brickearth' on the 1991 BGS 1:50,000 geological map	Present mainly in the East Stour River valley between Barrowhill, and Newingreen. Smaller deposits are located north of Lympne Industrial Park and north of Harringe Brooks Wood, (outcrop 32% of site area).

Table 2 Summary of Published Bedrock Geology

Period - Age	Strata	Generic Description	Extent
Cretaceous - Aptian	**Folkestone Formation**	Sandstone Medium- and coarse-grained, well-sorted cross-bedded sands and weakly cemented sandstones. Conformable lower contact with the silty clay or clayey silt of the Marehill Clay Member (Sandgate Formation).	Occurs in northeast corner of site only (outcrop 7% of site area)
Cretaceous - Aptian	**Sandgate Formation**	Sandstone, Siltstone and Mudstone Fine sands, silts and silty clays, commonly glauconitic and locally ferruginous or calcareous. Some soft sandstones. Reaches 50-100m thickness in West	North and east of site plus outliers at Lympne Industrial Park and north of Otterpool Quarry (outcrop 29% of site area)

Period - Age	Strata	Generic Description	Extent
		Sussex. Unconformable lower boundary with the Hythe Formation.	
Cretaceous - Aptian	**Hythe Formation**	Interbedded Sandstone and Limestone Alternating sandy limestones ("Ragstone") and (subequal or subordinate) glauconitic sandy mudstones (“Hassock”). Conformable indistinct lower boundary with the Atherfield Clay Formation.	Underlying the above sequence and outcropping in the south and west of the site. (outcrop 53% of site area)
Cretaceous - Aptian	**Atherfield Clay Formation**	Mudstone and siltstone Massive yellowing brown to grey sandy mudstone, with an important phosphatic pebble bed with vertebrate bones, gritty sandstone or very shelly sandy mudstone with glauconite, at the base. Disconformable lower contact with Weald Clay Formation.	Outcrops in the valley north of Harringe Brooks Woods in the west of the site (outcrop 8% of site area)
Cretaceous - Hauterivian	**Weald Clay Formation**	Mudstone Dark grey thinly-bedded shales and mudstones with subordinate siltstones, fine- to medium-grained sandstones, including calcareous sandstone, shelly and clay ironstones.	Forms the base of the valley north of Harringe Brooks Woods in the west of the site (outcrop 2% of outcrop area)

There are two inferred faults located on site. The first fault is located approximately 800 m inside the site’s western boundary, is approximately 1 km long, is trending north to south and the downthrow is to east, bringing the Weald Clay Formation adjacent to the Atherfield Clay Formation. The second fault is located on the eastern boundary of the site, is approximately 700 m long, is trending north to south and the downthrow is to the west, between the Folkestone and the Sandgate Formations.

The BGS records mass movement deposits (landslide) on the south-facing scarp slope of the Hythe escarpment to the south of the site.

3.1.1 Otterpool Quarry Geological SSSI

Otterpool Quarry, located in the centre of the proposed Otterpool Park site, is a former ragstone quarry active from prior to 1938 to sometime between 1970 and 1980. Evidence from historical mapping indicates that it comprised several pits, some of which are now partially backfilled.

The quarry is located in the Hythe Formation and the targeted mineral resource was Kentish Ragstone, ‘rag’ being a common term for low quality building stone. The ragstone often occurs in bands 15 to 60 cm thick [12], interbedded with the weak glauconitic calcareous sandstone hassock. Ragstone is present in some older buildings in Lympne and Westenhanger, although the quality of the stone from Otterpool Quarry may only have been sufficient for aggregates (‘roadstone’) [13].

The main areas of quarrying were the land now occupied by the lorry park (quarried 1932 to 1968) and the land between this and Upper Otterpool to the south (quarried from 1971).

The latter area is now designated as a Site of Special Scientific Interest (SSSI) for its geological interest. It is also a Geological Conservation Review (GCR) site. The site was designated as a SSSI in 1984 due to the significant exposures of the contact between the Hythe Formation and the overlying Sandgate Formation.

The last condition review, in 2012, reported that the site was in favourable condition. The site is currently grassed with some short trees along the former quarry edge and is used to graze sheep. It is regulated by Natural England who publish a list of operations likely to damage the special interest of the site. These include most types of construction and excavation activities. Any proposal that includes the operations on the list must be approved by Natural England, and this therefore imposes limits on the development in this location.

Further discussions regarding the SSSI are being sought with Natural England. This is outside the scope of this report and will be detailed separately.

3.2 Existing Ground Investigation Information

SLR (2008) Otterpool Quarry, Nr Hythe, Kent, Contamination Assessment [14]

A contamination assessment was prepared in 2008 for a planning application for a proposed materials recycling facility and anaerobic digestion plant in the current lorry park site. The report included results of groundwater and gas monitoring in this area and a reassessment of existing soil analysis data.

Relevant points are summarised below:

- The site was used for manufacture of cement and asphalt and vehicle maintenance. This was demolished in 2005.
- Above and below ground storage tanks were believed to have been located in the area of the bitumen and cement batching plant, as well as other below ground structures. The tanks were used for hydrocarbon storage and sump collection of run-off.
- A 2005 investigation found hydrocarbon contamination in the area of the former weighbridge and plant area together with impacts to shallow groundwater.
- Resting groundwater levels (in 2008) were within the Hythe Formation and within quarry backfill. Groundwater flow direction was tentatively given as northwards.
- One borehole recorded methane concentrations >1 % and four boreholes recorded carbon dioxide > 1.5%. Maximum borehole gas flow was 0.3 l/h.
- Risks to human health and controlled waters in the context of the proposed development were considered to be ‘low’ and no specific remediation was recommended beyond removal of buried tanks and obviously contaminated soils.

PBA (2008) Link Park, Lympne, Kent, Report on Hydrogeological Assessment [15]

PBA carried out a ground investigation and hydrogeological report for Phides Estates (Overseas) Ltd. in 2008 for the ‘Link Park’ proposed development. This comprised development for commercial/light industrial use of the former airport to the east of the Lympne Industrial Park. The report was prepared to discharge planning conditions related to concerns regarding the effect of the development on the springs in the Lympne Escarpment SSSI (250 m to the south of the Otterpool Park site).

The objectives of the report included characterising the hydrogeological and hydrological regime at the former airport and the escarpment to the south, in order to determine the potential hydrological and contamination impacts of the proposed development on the escarpment springs forming the Lympne Escarpment SSSI.

The report concluded that the groundwater in the Hythe Formation flows northwards, except for in wetter periods where there is a southward flow component towards the escarpment to the south, from a divide line approximately 370 m north of Aldington Road.

3.3 Hydrogeology

The Hythe Formation and Folkestone Formations are shown on Environment Agency (EA) mapping as Principal Aquifers. These are rocks that have high intergranular and/or fracture permeability and may support water supply and/or river base flow on a strategic scale.

The Sandgate Formation lying between the above two formations is classed as a Secondary (A) Aquifer by the EA. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The Alluvium is also a Secondary (A) Aquifer.

The Head Deposits within the site are mostly classed as unproductive strata, having low permeability that is likely to have negligible significance for water supply or river base flow. The Head Deposits at Hillhurst Farm in the northeast of the site are shown as a Secondary (Undifferentiated) Aquifer, probably due to their coarser composition (sand and gravel) as mapped by the BGS. Where present, the more impermeable layers will provide some protection to the underlying aquifers from contamination. Previous investigation has indicated infiltration rates ranging between 1×10^{-6} and 4.5×10^{-7} m/s [15].

There are no groundwater Source Protection Zones (SPZ) within 1 km of the site boundary. No abstraction or discharge consents for groundwater are recorded on site.

Groundwater flow within the Hythe Formation is usually through joints and fractures in the weathered limestone layers, with some limited matrix flow through the sand layers, depending on the proportion of clay or silt [16].

Downward percolating groundwater is retarded by the lower permeability of the underlying Atherfield Clay and is thus expected to flow northwards with the gentle dip of the clay strata, to emerge at springs feeding the East Stour River. Nearer the Hythe escarpment in the south, the groundwater will flow southwards to emerge at or below the contact between the Hythe and Atherfield Clay Formations sometimes to form springs in this area. The objective of the PBA report (Section 3.2) was to locate the groundwater divide in the south of the Otterpool Park site.

Groundwater in the superficial deposits is anticipated to be generally limited to the Alluvium around the streams and rivers.

Groundwater is anticipated to be at a relatively shallow depth in much of the site, as evidenced by the springs shown on OS maps at Otterpool Quarry and Newingreen Farm.

3.4 Hydrology

The site is located on moderately high ground at the head of the catchment of the East Stour River, which drains the wider area at the top of the escarpment and flows to the northwest, joining the Great Stour River at Ashford approximately 9.3km from the site.

The major surface water features within the site are the tributaries of the East Stour River running from Newingreen in the east down past the racecourse and Barrowhill and out of the northwest corner of the site. Another tributary drains Harringe Brooks Wood to the west of the site toward the same direction, following the line of the inferred fault.

Several ponds are present in the northern half of the site, the largest of which are in the centre of the racecourse and at Benham Water Farm (both shown on fine-grained Head Deposits).

As noted above the Lympne Escarpment SSSI is designated for its ecology, which is in part dependent on the springs that emerge at the top of the Atherfield Clay. Based on the PBA 2008 findings [15], the Otterpool Park development is unlikely to affect the hydrology of these springs, being north of the inferred location of the watershed line

A licenced surface water abstraction point is recorded west of the pond in the centre of Folkestone Racecourse. This is believed to have been for irrigation of the racecourse and is no longer in use. There are three discharge consents to surface waters shown on the site (Section 5).

4 HISTORICAL DEVELOPMENT

4.1 Historical Mapping

The historical development of the site and the surrounding area has been reviewed from historical OS maps, historical aerial photos, and other sources (e.g. Google Earth). The purpose is not to give a comprehensive overview, but to summarise features relevant to this assessment.

Potentially contaminative land uses and other features related to ground conditions within the site boundary and within 500m are summarised in Table 3. More significant features are noted up to 1 km, depending on the geological and hydrogeological setting and the distance over which significant effects can reasonably have the potential to occur.

Table 3: Summary of Historical Site Information

Historical Map	On site	Off site within 500m
1876-1877 1:10,560 scale	The site comprises fields, woods and scattered farm buildings. Wells are shown east and north of Newingreen. Various springs shown across the site. 'Tin Chimney Farm' is shown west of the Roman Road south of Westenhanger.	The South-Eastern Railway is shown in its current alignment along the northern site boundary with some lengths on embankment or in cutting. Westenhanger Station is located adjacent to the site northeast of the current racecourse. Westenhanger Castle and the East Stour tributary are also shown. A brick and tile works with a kiln is shown at Westenhanger immediately north of the railway.
1871-1883 1:2,500	A small pit, possible sand and gravel extraction, is shown in the northwest of the site approximately 470m west of Barrowhill.	No significant changes.
1898-1899 1:10,560 scale	A small quarry at Upper Otterpool is shown to the east of the access road from Ashford Road (not the main quarry area).	A quarry at Shepway Cross is shown 250m southeast of the site. Evidence of ground workings or pits at the brick works.
1898 1:2,500	The small pit west of Barrowhill has been filled.	No significant changes.
1907 1:2,500	Folkestone Race Course is shown with the Grandstand and race track in their current positions. A small extraction pit is shown along Stone Street in Lympne	No significant changes.
1908 1:10560	No significant changes.	'Kiln Wood' adjacent to site east of Newingreen. Shepway Cross quarry shown enlarged

Historical Map	On site	Off site within 500m
		A tank (probably water storage) is shown at Danehust (90m southwest of corner of site)
1931 1:10,560 (partial coverage)	A tank is shown at Little Sandling in the northeast of the site.	No significant changes.
1933-1938 1:2,500	A 'miniature range' is shown east of the airport adjacent to the residential development at Lympne. The small pit in Lympne is backfilled and houses are built over it.	No significant changes.
1938-1951 1:10,560	The main quarry at Otterpool Manor is shown (in the current SSSI area)	Three large hanger buildings are present adjacent to the south of the site in the area of the current industrial estate. Tanks and filter beds are shown at the sewage treatments works at Sandling Park – approximately 400m east of the site. The industrial buildings at the current day 'Newingreen industrial Estate' are shown.
1939 1:10,560	Lympne Airport is shown around the three hanger buildings. A water tank, various lights are shown in the area and the numerous smaller buildings in the area of the current industrial park. No paved runways are shown. A small sand or gravel extraction pit is shown in Lympne to the east of the airport.	Shepway Cross Quarry is larger.
1961 10,000	Lympne airport appears with a different building layout with the three main hangers no longer present. The airport boundary has been moved northwards. A few buildings are west of Otterpool Lane. Three buildings to the southwest of Westenhanger Station are no longer present.	The brick and tile works have been replaced by several long buildings labelled 'works'.
1970-1974 1:10,000	A pond, weighbridge and conveyor are shown in Otterpool Quarry. A refuse tip is shown 200m east of Upper Otterpool, possibly associated with the nearby quarry but may also have been used for disposal of other wastes. The 'miniature range' is shown as disused. A filling station is shown north of the quarry on Ashford Road. A small 'works' and a builder's yard are shown in Lympne near Berwick Lodge.	A small refuse tip is shown 90m northwest of the site (on current line of M20 motorway).

Historical Map	On site	Off site within 500m
1973-1978 1:10,000	The layout of Lympne Airport (labelled Ashford Airport) has changed. The main runway is shown orientated NW-SE and the taxiway at right angles to the west. Works are shown in the area of the current industrial estate and a pumping station is opposite off Otterpool Lane. The Otterpool Quarry is shown enlarged to its maximum extent and several small buildings are shown in the centre.	An electrical substation is shown 450m southeast of the site near Danehill. Engineering Works are shown at Coldharbour 600m east of the site. The quarry at Shepway Cross appear to have been restored to ground level with tracks and rough ground.
1989-1990 1:10,000	Overhead electricity lines run parallel to the railway and southwest to Harringe Court in the northwest of the site. A pumping station (sewage) is shown to the east of the circular race track at Folkestone Racecourse. The pond in the centre of the course is also now shown. Ashford Airport is still labelled but the buildings have been redeveloped into approximately the current layout of Lympne Industrial Park.	An electrical switching station is shown 80m west of the site. The M20 is shown north of the railway with the junction to the northeast on large embankments and a depot is shown 60m northeast of the site.
1986-1991 1:10,000 (partial coverage)	No significant changes	No significant changes

4.2 Aerial Photography

Historic England

Several aerial photographs are available from Historic England [17] which show Lympne Airport in 1929 and 1931. At least ten large hanger structures are located along Aldington Road in the southeast corner of the airport site, and three large hangers are present in the current Lympne Industrial Park area.

None of the main hangers are visible on photographs dated 1940 [8] which may indicate the site was redeveloped at this time or may reflect bomb damage or censorship (

Figure 6). The huts to the east of Otterpool Lane (currently derelict, Section 2.2.2) are shown in aerial photographs from 1940 to 1990, some having been demolished over time. Paved runways are not shown until 1990 (Figure 7) when they appear in their current (partly demolished) layout.

Figure *5* – Aerial photograph of Lympne Airport 1940 with Framework Masterplan red line boundary and current extent of industrial park [8]

Figure 6 – Aerial photograph of Lympne Airport 1960 with approximate Framework Masterplan red line boundary and current extent of industrial park [8]

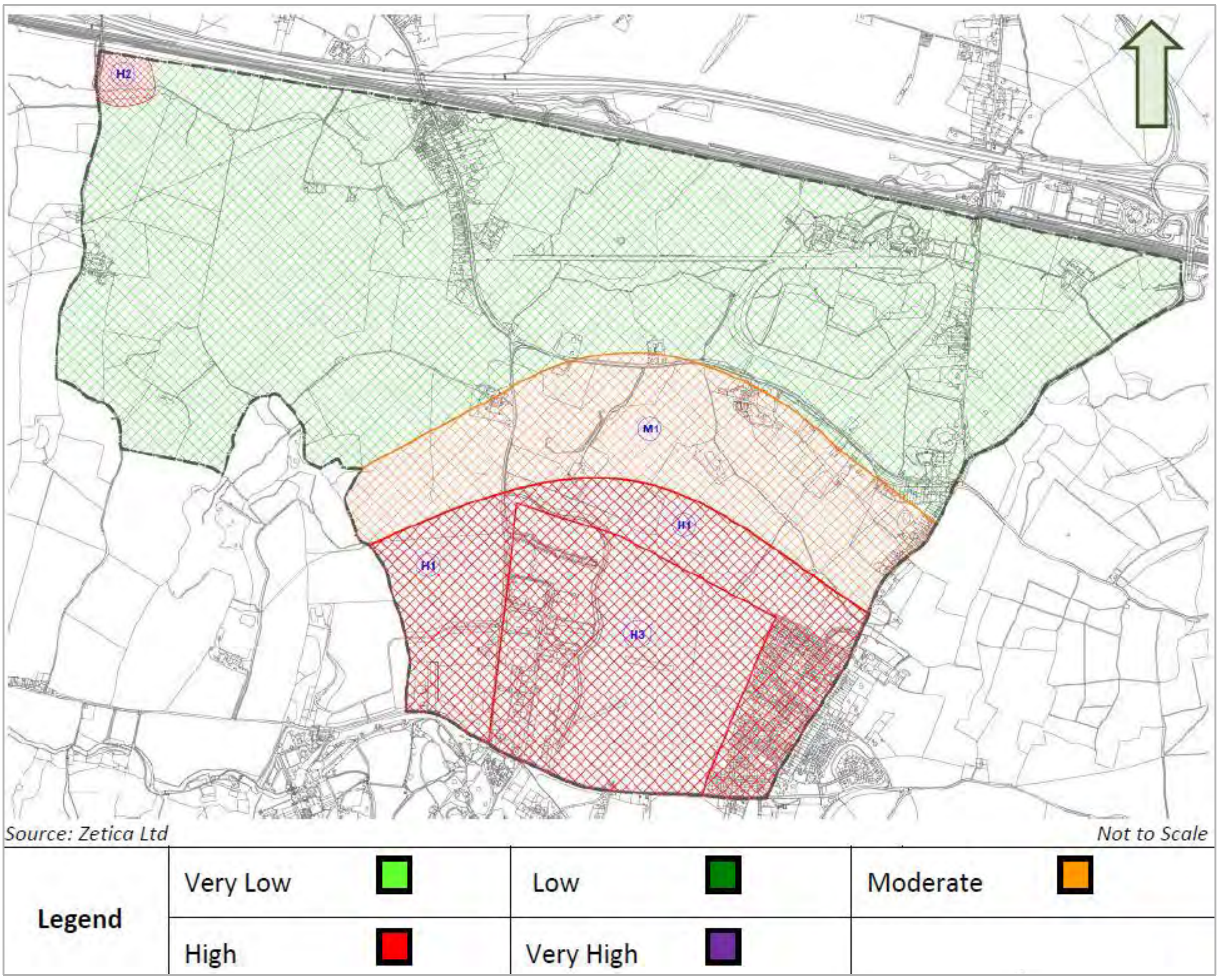
Figure 7 – Aerial photograph of Lympne Airport 1990 with approximate masterplan red line boundary and current extent of industrial park [8]

4.3 Unexploded Ordnance (UXO)

4.3.1 UXO Desk Study

Lympne Airport is known to have been used as an RAF base during WW2. As such there is a high potential for Unexploded Ordnance (UXO) hazards in this area. A specialist subconsultant, Zetica Ltd, was commissioned by Arcadis to carry out a UXO desk study and risk assessment for Otterpool Park. Full details are contained in the Zetica desk study report [18] and the main findings are summarised briefly below.

- Records indicate that over 500 No. high explosive bombs were dropped on the south of the site around RAF Lympne in WW2. Therefore, this part of the site is assigned a high UXO hazard level (H1) and the area around it a moderate hazard level (area M1 in Figure 8).
- An abandoned bomb is potentially located on the northwest corner of the site and is therefore assigned a high hazard level (area H2 in Figure 8).
- Pipe mines are known to have been laid under the runways at RAF Lympne to destroy the airport in the event of invasion. A clearance certificate was issued in 1946, however, further pipe mines were discovered in the 1950s and 1960s, indicating that the clearance was incomplete. A 2002 letter from an Explosive Ordnance Disposal (EOD) engineer indicated that there was a high possibility of uncleared pipe mines and recommended full clearance prior to development works This area (H3) has therefore been given a high hazard level.
- No records of UXO were found for the rest of the site, which is given a low hazard level.



Source: Zetica Ltd

Not to Scale

Figure 8 – UXO hazard level map *(extract from Zetica UXO desk study and risk assessment report [18])*

It is noted that the current masterplan includes some development within the high-risk areas including those where pipe mines may be present (Figure 9). It is likely that UXO clearance measures including intrusive and non-intrusive surveys will be required prior to development in these areas.

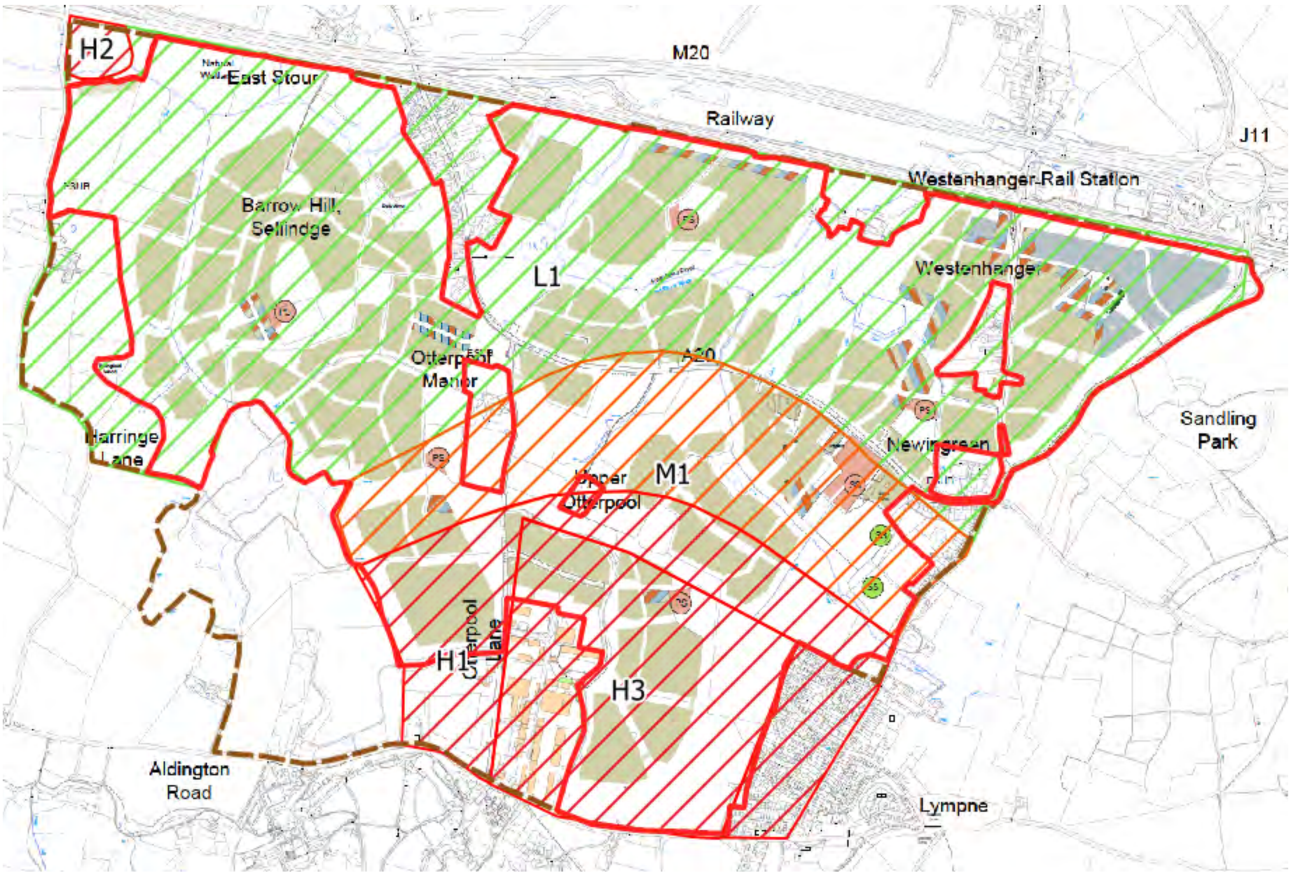


Figure 9 – UXO hazard level and current masterplan

Previous redevelopments of former military air bases have occasionally encountered radiological soil contamination, from the use of radium in luminescence dials, e.g. for flight instruments. These are generally associated with former burning or waste pits, or aircraft crash sites. No evidence of such contamination has been found at the site, based on desk study information and the preliminary ground investigation, but if any ashy fill material is encountered during further investigations or the development should be assessed for the presence of radiological contamination.

Further details on the history of the site in relation to the UXO risks are given in the UXO desk study report [18] in Appendix D.

4.3.2 UXO Geophysical Surveys and Risk Mitigation

During Phase 2 of the preliminary ground investigation, Zetica carried out active UXO avoidance measures for the exploratory holes in the area of the former airport. The objective was to safeguard the ground investigation against Unexploded Bombs (UXB) and pipe mine hazards and obtain additional information on potential UXO locations. The surveys comprised:

- Initial non-intrusive geophysical survey using a towed rig combing a surface magnetometer with a multi-frequency electromagnetic sensor (MFEM) in a 50x50m area around each exploratory hole position in high hazard areas to identify potential shallow buried UXO;
- Downhole magnetometer for boreholes in high hazard areas (WS201-203 and BH201-204) between 2 m and 6 m depth; and,
- Explosive Ordnance Clearance (EOC) engineer watching brief during excavation of 14 No. trial pits.
- Additional findings of the UXO surveys are summarised below. Reference should be made to the Zetica Risk Mitigation Report [19] in Appendix E for the full findings.

- 249 No. isolated metallic anomalies were identified, whilst the majority are likely to be other metal items, the potential for them to be UXB could not be discounted;
- 38 No. linear features were identified which could not be discounted as potential pipe mines (red features in Figure 10);
- The non-intrusive survey also detected other buried features including utility services, demolition arisings, airport infrastructure, archaeology, areas of possible buried waste and other buried obstructions as shown on P6248-17-DWG03-D Summary Interpretation Plan (Appendix E);
- Several areas of dense magnetic anomalies were detected, possibility indicating areas of buried waste disposal. Three of these were investigated with trial pitting in Phase 2 (Table 7);
- Phase 2 exploratory holes were moved a minimum of 20 m from potential pipe mines; and,
- No magnetic anomalies indicative of potential UXO were detected with the down-hole magnetometer during drilling of the window samples and boreholes.

Figure 10: Extract from Zetica drawing P6248-17-DWG03-D Summary Interpretation Plan (Appendix E)

The results of the UXO desk study and risk mitigation reports may be useful when assessing the risk to the proposed garden town development(s) from UXO-related hazards. The information on other buried features can also be used to better inform future ground investigations or development layouts, where significant obstructions can be either investigated early-on or avoided.

5 ENVIRONMENTAL INFORMATION & REGULATORY CONSULTATIONS

5.1 Introduction

Environmental information for the site and the surrounding area was obtained in the form of GIS data from Landmark Information Group Ltd. The data has been reviewed to provide information for the site, where relevant in the context of the site and the objectives of this report.

The dataset includes statutory data as provided by the EA, as well as Natural England and Local Authorities. The dataset is produced by querying the database to a defined distance from the site boundary.

5.2 Summary of Environmental Databases

A summary of Environmental Information is given in Table 4 below.

Table 4: Summary of Environmental Information

Type	Within site boundary	Within 500m of site boundary
Fuel Station Entries	Petrol storage facility – (Auto repair at Area Autos by airport cafe	Lympne Industrial Park (non-retail HGV) Crosskeys LPG Service Station (LPG) (Obsolete), Newingreen Shell M20 Channel Gateway Motorway Service Area Sellindge Service Station (Obsolete)
Contemporary Trade Directory Entries	23 further entries at Otterpool Manor, Newingreen, and Westenhanger.	59 entries (15 active) at Lympne Industrial Park including freight handling, printers, vehicle repairs, and food manufacturers. 2 entries at the M20 service area – petrol filling station and vehicle breakdown and recovery 8 entries in Sellindge to the northwest – includes engineering services, vehicle repair and dairy. 4 entries in Lympne to the southeast including cleaning services and engineering.
Electrical substations	1No. located within the former racecourse	6 No. located in Lympne and Lympne Industrial Park. 3 No. east and west of the site along B2067 and to the northwest in Sellindge
Tanks	None	5 No. to the south of the site south of B2067, 1No. north of the railway near Westenhanger

Type	Within site boundary	Within 500m of site boundary
IPPC	None	1No Biodiesel manufacturer at Harringe Court Cottage
LAPPC	Otterpool Quarry (ceased) *Lafarge Aggregates crushing of inert materials.*	M20 service area (petrol filling station) 4No. in Lympne Industrial Park including vehicle respraying and general coating processes.
Pollution Incidents	Newingreen – Minor incident, fire at Royal Oak Public House, release of fire water/foam to drain (1998)	Lympne Industrial Park, Significant incident, failure of above ground plastic tank release of phosphoric acid (1999). Significant impact to water (east of Lympne village) (180m east of site) Danehurst wood Minor Incident Agricultural (Slurry/Animal Waste) Pollutants (1995) (350m west of site) Barrowhill – minor incident Construction / Demolition Material: Inert Street Works Waste (1999)
BGS Recorded Mineral Sites	Otterpool Quarry – Ceased. Cretaceous sandstone/limestone. Hythe Formation. Opencast	Shipway Cross (east of Lympne Village) Ceased. Cretaceous sandstone/limestone. Hythe Formation. Opencast (now infilled, see landfill details). Westenhanger Tile and Brickworks – Ceased. Quaternary Clay and Shale. Head Deposits. Opencast
Quarrying not recorded elsewhere	Small sand and gravel pit (1939) NW Lympne Village	None
Radon	Lower Radon Potential (less than 1% of homes are estimated to be at or above the Action Level)	
Landfill	Lympne Industrial Park (north) Keedale Ltd, Licence cancelled, 75,000-250,000 tonnes per year. (First waste input 1992) 'included inert waste'	'Quarry Field' (located east of Lympne village) 520 m from site. Last waste input 1962. Included inert and household waste. (former Shipway Cross Quarry).
Discharge Consents – surface waters	P02136 located at the lorry park, Tarmac Ltd. Surrendered in 2013. Sewage discharge (final/treated effluent) to River Stour. P20116 located west at Barrow Hill Farm Cottages. Dassie Property Investments Ltd, issued 2004. Sewage discharge	4 discharge consents to surface waters are recorded within 500m north of the site. These are either private sewage discharges or associated with construction sites and therefore likely to be small scale or temporary discharges.

Type	Within site boundary	Within 500m of site boundary
	(final/treated effluent) to River Stour. P02441 located in northeast corner of site. Weaver Hotels (Kent) Ltd. Issued 1989. Lapsed. Other matter, to freshwater river.	
Discharge Consents – into land	None	P06988 located in Lympne Industrial Park. Spicers Estates Ltd. issued 2012. Trade effluent-site drainage into soakaway.

5.3 Direct Consultation

Table 5 summarises the direct consultation undertaken to date with the relevant statutory bodies and the main issues arising.

Table 5 Consultation Undertaken to Date

Consultee	Contact (Date)	Summary of Issues Raised/Agreed
Shepway District Council (SDC)	Wai Tse, Environmental Protection Officer, Environmental Health. (19 December 2016)	The EIA should include contaminated land implications from Westernhanger train station; Ashford Lane quarry (i.e. Otterpool Quarry Geological SSSI)/ lorry park) and former Lympne Airport. The Shell petrol filling station located at stop 24 Services to the northeast of the site has underground fuel storage tanks and Part B permit (vapour recovery). No environmental nuisance issues were recorded. There is a bunded diesel above ground storage tank at the racecourse. No further details or leakages have been recorded. The rest of the racecourse had LPG but this has been decommissioned.
Environment Agency (EA) Kent and South London	Lucy Payne, Customers and Engagement officer. (7 December 2016)	The EA provided further environmental desk based information on licenced abstractions and pollution incidents. The data supports that reviewed earlier and is summarised in Section 5.2 above. Pollution incidents are shown in Drawing 0005.
Natural England (NE)	Julia Coneybeer, Sustainable Development Sussex and Kent. (9 May 2017 (site meeting), 17 May 2016 (letter from NE))	In summary, Natural England state '*Otterpool Quarry is located within the centre of the proposed Otterpool Park garden town site. Its geological interest and open space mean it could form a key asset and even focal point of the garden town's Green Infrastructure (GI) strategy, with the benefit of improved access for the local community, an opportunity for education and recreation, and enhancement of the geological exposure itself to improve its use as a national scientific resource. The SSSI should be protected in its entirety, and integrated into the development of the garden town in a way which realises the best of these benefits.*' .

6 CONCEPTUAL SITE MODEL

As part of the development of a Conceptual Site Model consistent with the principles of CLR 11 [20], potential contaminant sources, pathways and receptors which may form part of an active contaminant linkage have been identified from the desk study and site walkover information presented above.

6.1 Potential Contaminant Sources

Potential contaminant sources have been identified associated with the historical land uses identified in Section 4 and environmental records in Section 5. Features are shown on Drawing 5002 and summarised in Table 6.

Potential Contaminants of Concern (CoC) have been identified for each source based on current guidance [21] and generic knowledge of the source type. It is not a comprehensive list of all contaminants that could be present at the site but has informed the chemical analysis undertaken as part of the recent ground investigation.

Table 6 Potential Contaminant Sources

Potentially Contaminative Land Use	Description	Potential CoC
1. Westenhanger train station and railway line (off site)	Present from before 1876 to present day. Line is currently electrified by 3rd rail. Adjacent to the northern site boundary but hydraulically downgradient of the site.	Heavy metals, sulphates, asbestos, Polycyclic Aromatic Hydrocarbons (PAH), chlorinated hydrocarbons, PCBs, herbicides.
2. Otterpool quarry (ragstone quarry, cement &asphalt works, lorry park)	Potential sources include quarry backfill, refuse tip (1970), demolition of quarry or cement works buildings, known underground tanks may still be in situ, lorry fuel and oil spillages.	Heavy metals, sulphates, petroleum hydrocarbons, PAH, asbestos, ground gases.
3. Former spoil heap/refuse tip	Former spoil heap/refuse tip shown on historical maps 1971 to 1978. No details of waste deposits are available, but it may be associated with the spoil from Otterpool Quarry or redevelopment of the airport.	Heavy metals, petroleum hydrocarbons, PAH, asbestos, ground gases, cyanides, petroleum hydrocarbons, PCBs, AFFF/PFAS, asbestos. UXO and radiological hazards may also be present.
4. Landfill site north of Lympne Industrial Park	The landfill composition is currently unknown but likely to be of limited degradation potential based on the available information and lack of a permit or leachate and gas control measures.	Heavy metals, asbestos, ground gases
5. Soil bunds north and east of Lympne Industrial Park and on former airport	The bunds are assumed to be formed of Made Ground and evidence from aerial images suggests that they formed around DATE during the works associated with the Link Park Development reported by PBA (Section 3.2).	Heavy metals, asbestos, ground gases
6. Lympne Industrial Park	HGV fuel storage and distribution, vehicle maintenance, truck wash, steel engineering works, electrical substation, LPG storage	Heavy metals, cyanides, sulphates, petroleum hydrocarbons, asbestos.
7. Newingreen Industrial Estate	An above ground fuel storage tank was observed during the site walkover. Trade directory entries	Petroleum hydrocarbons, asbestos.

Potentially Contaminative Land Use	Description	Potential CoC
	(inactive) include road haulage and logistics businesses.	
8. Former Lympne Airport	Active from 1916 to the 1970s. Aircraft storage and maintenance areas were mostly under Lympne Industrial Park. Records of bombing and aircraft crashes.	Heavy metals, cyanides, petroleum hydrocarbons, PCBs, AFFF/PFAS, asbestos. UXO and radiological hazards may also be present.
9. Former filling station, current Arena Autos garage	Filling station shown on 1970 historical map, now a small vehicle repair shop, scrap vehicle storage at Mink Farm.	Heavy metals, cyanides, petroleum hydrocarbons, volatile hydrocarbons, asbestos
10. Pumping Station	Sewage pumping station currently run by Southern Water. Recorded pollution incidents in 2011 and 2015 relating to sewage overflow (minor impact to land and water).	Heavy metals, cyanides, petroleum hydrocarbons, ammoniacal nitrogen, asbestos, ground gases.
11. Folkestone Racecourse waste and fuel storage and electrical supplies	Includes above ground bunded fuel tanks, LPG tank, electrical substation, pole mounted transformers, waste storage area (Section 2.2.2).	Petroleum hydrocarbons, PAH, PCB.
12. Motocross track	Racing only, no known maintenance or fuelling facilities. Potential for fuel spillages.	Petroleum hydrocarbons
13. Former rifle range	Rife range shown on historical maps circa. 1930s to 1970.	Heavy metals (especially lead), asbestos. UXO hazards may also be present.

The site covers a large area and other potential small point sources and diffuse sources (current and historical) are likely to associated with agricultural and industrial activities, including but not limited to, fuel and oil storage, crop spraying, soakaways and septic tanks, and small areas of informal burning and waste disposal.

Other potential sources identified in Sections 4 and 5 are considered unlikely to impact the proposed development and are not considered further. This is because an active contaminant linkage is considered unlikely due to the age and/or size of the source, distance from the proposed development, and/or be unlikely to affect the receptors due to being hydraulically downgradient (e.g. Westenhanger Station) or separated by impermeable strata.

6.2 Relevant Receptors

Potential contamination receptors associated with the proposed development as shown in the masterplan are identified below. There is public access across much of the site at present. Certain areas within the site boundary will maintain their current land use under the proposals, thus existing site users have also been considered as potential receptors of contamination.

This assessment does not consider risk to neighbouring land and occupants, or construction, groundworks and maintenance workers for buildings and utilities.

Contamination risks to construction workers are not appraised by chronic (long-term) exposure human health risk assessments. Site specific risk assessment and appropriate health and safety practices to adequately mitigate the potential risks to construction workers are recommended for any future works. Works should be conducted in accordance with the Health and Safety Executive publication entitled "Protection of Workers and the General Public during the Development of Contaminated Land", 1991 [22], the CDM Regulations (2015) [23] and any other relevant guidance.

Human Health

- On site residents – low density housing with private gardens
- On site residents – high density housing
- Employees at proposed and existing commercial/industrial units
- School teachers and students
- Recreational space users
- Allotment holders

Controlled Waters

- Principal Aquifer – Hythe Formation
- Principal Aquifer – Folkestone Formation
- Secondary (A) Aquifer – Sandgate Formation
- Secondary (A) Aquifer – Alluvium
- Secondary (Undifferentiated) Aquifer – Head Deposits (northeast corner only)
- Springs within the site and Lympne Escarpment SSSI to the south.
- Field drains, ponds, streams and tributaries of the East Stour River
- East Stour River and subsequent watercourses.

Built Environment

- Existing and proposed buildings and foundations
- Existing and proposed subsurface utilities

6.3 Potential Pathways

Potential pathways of any contamination from the above sources to the identified receptors on the site are identified below:

Human Health

- Direct dermal contact by humans with contaminated soil and/or groundwater;
- Ingestion of contaminated soil and/or groundwater by humans;
- Outdoor or indoor inhalation of gas and volatile organic compounds;
- Uptake of soil and/or groundwater contamination by crops and ingestion by humans (private gardens only)
- Ingestion or inhalation of airborne dust;

Controlled Waters

- Leaching of contaminants from soil into groundwater;
- Lateral migration of impacts within groundwater on site;
- Lateral migration of impacts within groundwater off site;
- Groundwater migration to provide base flow to surface waters;
- Lateral/ horizontal movement of non-aqueous phase contaminants through the soil pores,

Built Environment

- Ingress into underground structures.

A contamination risk is only present where a source – pathway – receptor linkage is active. The list of higher likelihood potential sources, pathways and receptors was used to target the preliminary ground investigation described below.

7 PRELIMINARY GROUND INVESTIGATION

7.1 Background and Scope

To address the potentially significant risks to the masterplan and areas of uncertainty identified in the Stage 1 Feasibility Report [1], a preliminary ground investigation was carried out in two phases.

- Phase 1 in August 2017
- Phase 2 in August/September 2018

The ground investigation had two principal objectives:

1) Identify whether significant areas of soil or groundwater contamination were associated with the higher potential historic land uses, that, if present, may affect the proposed development and/or require significant remediation; and
2) Obtain preliminary data on geotechnical characteristics and soil infiltration rates to inform the outline drainage strategy.

Objective 1 is the subject of this report. Data from exploratory holes undertaken for Objective 2 are summarised in this report but reference should be made to the Water Cycle Study Report [24] for detailed interpretation of infiltration results.

In addition, the investigation provided preliminary information on the overall geology and hydrogeology of the site to help inform a preliminary ground model that should be further developed at later stages of the design.

The investigation will also provide quantitative baseline data on soil and groundwater quality for inclusion in the EIA.

7.1.1 Phase 1 August 2017

The scope of the Phase 1 ground investigation comprised:

Exploratory holes:

- 5No. rotary cored boreholes up to 10 m bgl with 50mm standpipe screening the bedrock geology to determine strata depths and thickness and monitor groundwater levels.
- 12No. machine dug trial pits up to 2.8 m bgl to enable BRE365 soakaway tests in near-surface soils for infiltration data;
- 12No. windowless sampled boreholes up to 5 m bgl with 8No. gas and groundwater monitoring standpipes to identify contaminated soils and groundwaters and ground gases;
- 3No. hand dug pits to 1.2 m bgl to identify contaminated soils at the motocross track;
- 1No. machine dug trial pit to 3.8 m bgl to identify contaminated soils and subsurface obstructions at the lorry park.

Testing:

- Soakaway testing of shallow soils and deep borehole infiltration testing to obtain infiltration rates;
- PID field screening for Volatile Organic Compounds (VOC);
- Standard Penetration Testing (SPT) to determine ground density;
- Geotechnical laboratory testing of soil samples;
- Geo-environmental laboratory testing of soil and groundwater samples; and
- 3No. return monitoring visits to monitoring groundwater levels and ground gases.

The Phase 1 site works were carried out between 14th and 25th August 2017. Return monitoring was conducted in three weekly visits between the 1st and the 15th September 2017.

7.1.2 Phase 2 August/September 2018

The scope of the Phase 2 ground investigation comprised:

Exploratory holes:

- 8No. rotary cored boreholes up to 10 m bgl with 50mm standpipe to determine strata depths and thickness and monitor groundwater levels.
- 17No. machine dug trial pits up to 2.7 m bgl to enable BRE365 soakaway tests in near-surface soils for infiltration data;
- 8No. machine dug trial pits up to 3.4 m bgl to investigate areas of potential waste deposits, contaminated soils and subsurface obstructions.
- 3No. windowless sampled boreholes up to 5 m bgl with 3No. gas and groundwater monitoring standpipes to identify contaminated soils, groundwater and ground gases;
- 1No. hand dug pit to 1.0 m bgl to investigate potential contamination and subsurface obstructions at the former rifle range.

Testing:

- Soakaway testing of shallow soils and deep borehole infiltration testing to obtain infiltration rates;
- PID field screening for Volatile Organic Compounds (VOC);
- Standard Penetration Testing (SPT) to determine ground density;
- Geotechnical laboratory testing of soil samples;
- Geo-environmental laboratory testing of soil and groundwater samples; and
- 3No. return monitoring visits to monitoring groundwater levels and ground gases.

The Phase 2 site works were carried out between 15th August and 6th September 2018. Return monitoring was conducted in three weekly visits between the 19th September and the 11th October 2018.

The results of the infiltration testing and subsequent outcomes for the outline drainage strategy are reported elsewhere [3] [24]. This report presents the results of the preliminary ground investigation in terms of the geotechnical and geo-environmental conceptual models for the masterplan phase of the development.

7.1.3 Exploratory Hole Summary

A summary of the exploratory holes targeting potential contaminant sources (Ground Investigation Objective 1) is given in Table 7. Due to the nature of the development and on the understanding that most of the potential contaminant sources are to remain in their current use and are outside of the proposed redevelopment area, most of the boreholes were targeted at the contaminant pathway where the potential contamination source is outside the development area.

Table 7 Summary of Exploratory Holes targeting Potential Contaminant Sources

Location ID	Final Depth (m bgl)	Installation screening	Potential Contamination Source (row no. from Table 6)
WS101	3.0	None	Lympne Industrial Park (6)
WS102A WS102B	0.3 0.2	None None	Lympne Industrial Park Landfill (4)
WS103	5.0	Head Deposits	Lympne Industrial Park Landfill (4)
WS104A WS104B WS104C	0.3 0.15 4.0	None None Head Deposits	Former Otterpool quarry / former cement manufacturer / current lorry park (2)

Location ID	Final Depth (m bgl)	Installation screening	Potential Contamination Source (row no. from Table 6)
WS105	2.85	Head Deposits	Vehicle repair yard (Arena Autos) (9)
WS106	3.0	Head Deposits	Mink Farm (scrap vehicles) (9)
WS107	3.0	Head Deposits	Sewage pumping station (10)
WS108	2.8	Head Deposits	Racecourse (fuel storage, substation and waste storage area) (11)
WS109	3.0	None	Roads and car parks at Newingreen (7)
WS110	3.0	None	Racecourse (fuel storage, substation and waste storage area) (11)
WS111	0.6	None	Newingreen Industrial Estate and above ground storage tank (7)
WS112	3.5	Head Deposits	Lympne Industrial Park Landfill (4)
TP113	3.8	None	Former Otterpool quarry / former cement manufacturer / current lorry park (2)
HD101 HD102 HD103	1.2 1.2 1.2	None None None	Motocross racing track (12)
BH201	5	Head Deposits/Hythe Formation	Lympne Industrial Park Landfill (4)
BH202	10.5	Hythe Formation	Lympne Industrial Park Landfill (4)
BH203	10.5	Head Deposits /Hythe Formation	Former spoil heap/refuse tip shown on historical maps 1971 to 1978 (3)
TP201	3.4	None	Lympne Industrial Park Landfill and Zetica dense ferrous objects anomaly Z62 (4)
TP202	2.6	None	Lympne Industrial Park Landfill and Zetica dense ferrous objects anomaly Z29 (4)
TP203	1.3	None	Stockpile/bund material located east of Lympne Industrial Park (5)
TP204	1.9	None	
TP205	1.2	None	
TP206	0.7	None	Former spoil heap shown on historical maps 1971 to 1978 (3)
TP208	2.6	None	Former Lympne Airport (8)
TP209	2.35	None	
TP210	2.5	None	

Location ID	Final Depth (m bgl)	Installation screening	Potential Contamination Source (row no. from Table 6)
TP211	2.05	None	
TP223	2.6	None	
TP226	0.4	None	
TP227	2.3	None	Stockpile/bund material located in centre of former airport (5)
TP228	1.7	None	Former airport - possible Made Ground at Zetica anomaly Z26 (8)
WS201	3.5	Head Deposits /Hythe Formation	Lympne Industrial Park (off-site) (7)
WS202	5.0	Head Deposits	
WS203	3.0	Head Deposits	
HD201	1.0	None	Former rifle range (13)

The majority of the windowless sampled boreholes refused before the target depth of 5 m bgl. WS102A and WS102B both refused on rockhead at 0.3 m and 0.2 m bgl respectively. WS104A and WS104B refused in shallow Made Ground and were replaced by WS104C 70 m north within the lorry park. WS201 and WS203 refused at 3.5 and 3.0 m bgl while WS202 reached the target depth of 5.0 m bgl. The presence of Head Deposits in WS201 to WS202 indicates that they extend further south than suggested by the geological map.

The thickness of Made Ground was not sufficient for installation of standpipes screening this material, and therefore all the standpipes screen natural soils.

Further details on the methodology and the full results of the ground investigation, including exploratory hole engineering logs, in-situ tests, geotechnical and geo-environmental laboratory test results, and monitoring data are presented in the Phase 1 Ground Investigation Report [25] and Phase 2 Ground Investigation Report [26].

Exploratory hole locations are shown in Drawing 0003.

7.2 Ground Conditions Encountered

7.2.1 Strata Summary

A summary of the locations, thicknesses and composition of the strata encountered during the recent ground investigations is presented below. Exploratory hole logs are included in the factual reports [25] [26].

Table 8 and Table 9 summarise the strata encountered in the north and south of the site respectively; defined as roughly north and south of the A20. Bedrock at the site dips shallowly down to the north and therefore the surfaces of bedrock strata are generally at a lower elevation in the north of the site compared to the south. “Not proven” in brackets means that the whole formation thickness was not proven.

*Table 8 Summary of Strata Encountered – North**

Strata Encountered	Thickness (m)	Depth to top of strata (m bgl)	Elevation of top of strata (m AOD)
Topsoil	0.2 – 0.5	0.0	57.9 – 84.3
Made Ground	0.1 – 0.6	0.0 – 0.35	58.0 – 82.2
Alluvium	1.1 – 3.5	0.2 – 0.5	57.6 – 70.1
Head Deposits	0.6 – 4.6	0.2 – 2.0	58.3 – 81.1
Folkestone Formation	Up to 1.2 (not proven)	1.2 – 1.3	75.6 – 80.5
Sandgate Formation	Up to 6.5 (not proven)	0.3 – 4.6	60.6 – 84.0
Hythe Formation	Up to 7.5 (not proven)	2.3 – 7.1	64.0 – 67.8
Atherfield Clay Formation	Up to 2.3 (not proven)	0.2 – 1.3	57.3 – 63.8
Weald Clay Formation	Up to 6.7 (not proven)	3.8	54.1

*North of Ashford Road: BH102, BH103, BH105, TP101, TP102, TP103, TP105, TP106, WS105, WS106, WS107, WS108, WS110, WS111, TP213, TP214, TP215, TP217, TP218, TP219, TP220, BH206, BH207, BH208, BH209

*Table 9 Summary of Strata Encountered – South***

Strata Encountered	Thickness (m)	Depth to top of strata (m bgl)	Elevation of top of strata (m AOD)
Topsoil	0.1 – 0.6	0.0	65.2 – 106.4
Made Ground	0.1 – 3.1	0.0 – 0.5	80.3 – 106.6
Alluvium	0.5	0.4	72.6
Head Deposits	0.25 – 4.7	0.1 – 1.2	65.0 – 106.3
Folkestone Formation	Not encountered		
Sandgate Formation	2.0	4.0	97.2
Hythe Formation	Up to 9.9 (not proven)	0.2 – 6.0	85.3 – 106.1
Atherfield Clay Formation	Up to 3.2 (not proven)	6.8	87.8
Weald Clay Formation	Not encountered		

**South of Ashford Road (not including trial pits in above-ground bunds): BH101, BH104, HD101, HD102, HD103, TP104, TP107, TP108, TP109, TP110, TP111, TP111A, TP112, TP113, WS101, WS102A, WS102B, WS103, WS104A, WS104B, WS104C, WS109, WS112, TP201, TP202, TP206, TP208, TP209, TP210, TP211, TP221, TP222, TP223, TP226, TP228, BH201, BH202, BH203, BH204, HD201, WS201, WS202, WS203

Descriptions of the materials encountered in the 82 No. exploratory holes are summarised in the sections below. Results of in-situ testing in each stratum are presented in Section 12.2. Exploratory hole locations are shown relative to the geological units on the site in Drawing 0004.

7.2.2 Made Ground / Topsoil

Topsoil was encountered in 63 exploratory holes up to 0.6m thick. Made Ground was encountered in 24 of the 82 No. exploratory holes, associated with areas of previous development or filling. Locations included the lorry park/former quarry (TP113, WS104(A-C)), the road off the A20 roundabout (BH105, TP103), at Newingreen (WS111, TP109) and areas surrounding the former airport and current Lympne Industrial Park entrance (WS101, TP201, TP202, BH202, BH203, BH204). The base depth of the Made Ground was recorded between 0.15 m (WS104B) and 3.1 m bgl (TP113) and was generally of very limited thickness across the site.

Various lithologies were recorded including gravelly clay, sandy silt and gravel.

Anthropogenic materials logged included concrete, charcoal, plastic (TP109, TP204), metal (TP202, TP204), slag, wood, and brick. A hydrocarbon odour was noted in TP113 between 0.0 and 0.4 m bgl. Other than those observations, no grossly contaminated or highly putrescible materials were observed in the Made Ground.

7.2.3 Alluvium

Alluvium was encountered in six of the exploratory holes in the centre of the site near to the East River Stour and its tributaries. Thicknesses between 0.5 m and 3.5 m were proved, comprising mainly very soft to soft grey and orangish brown clay with minor amounts of sand and gravel of limestone and sandstone with some flint.

7.2.4 Head Deposits

Head Deposits were encountered in 51 of the 72 exploratory holes across the site. Head Deposits are formed due to weathering and slope processes such as solifluction. Due to the mixing effect of these processes the material is often highly variable. Parent materials at the site are likely to be the Lower Greensand formations or the younger Gault Clay and chalk of the White Chalk Subgroup, which would have overlain the site in the geological past but have now been removed by erosion.

The lithology was predominantly silty or sandy clay with some clayey sand and gravel. No clear pattern in principal grain size was apparent in the distribution of the Head Deposits across the site. The clay was generally described as soft to firm and brown or brownish grey, sometimes mottled orange. Pockets of black, orange or white fine sand (up to 20 mm) were encountered in TP108 at 1.3 m, TP107 at 0.5 m, and TP104 at 1.4 m bgl. Secondary constituents were fine to coarse sand and/or subrounded to angular gravel of limestone, sandstone and flint.

Where Head Deposits were recorded as coarse-grained materials (sand or gravel), they were generally medium dense, greenish or orangish brown fine to medium (occasionally coarse) sand. TP112 encountered clayey sandy gravel of limestone from 0.3 to 1.6 m bgl. These are indicative of the Hythe and Sandgate Formation parent material on the site.

Recorded thicknesses for Head Deposits ranged from 0.25 m (TP206, TP226) to 4.65 m (not proved in WS103) although the base of the Head Deposits was not reached in 60% of the locations where this stratum encountered. Head Deposits were more widespread than shown on the geological map [9], in particular around the former airport where they were recorded as more than 2 m thick in BH210 and BH204 in the south of the site.

7.2.5 Folkestone Formation

The Folkestone Formation was only recorded in TP214 and TP215, located around Westenhanger in the northeast of the site. It was described as soft dark grey mottled brown silty fine sand and silts, 1.2m thick. However, this material could be the Marehill Clay Member of the underlying Sandgate Formation, based on the BGS description of this unit.

The Folkestone Formation appears to be absent where this unit is mapped at BH105 in the northeast of the site. This borehole instead encountered Head Deposits directly over silts and sands of the Sandgate Formation, which is consistent with previous nearby investigations recorded in BGS logs [27].

7.2.6 Sandgate Formation

The Sandgate Formation was encountered in BH101, BH102, BH105, BH206, BH208, TP213 and WS105. It comprised 1.5 to 2.0 m of loose to dense, yellow and brown, slightly silty, fine to coarse sand, over 2.5 m of very stiff brown sandy or gravelly clay. The gravel was angular fine to coarse mudstone and siltstone.

Sandgate Formation was recorded at 4.1 m thick at BH102 in the northwest of the site indicating it may extend further west than is shown on the geological map.

7.2.7 Hythe Formation

The Hythe Formation was encountered in 21 exploratory holes. This formation consisted of interbedded weak sandstone and limestone. The limestone was described as medium strong to strong grey micritic limestone. The rock appeared highly fractured with both subhorizontal and subvertical open fractures closely spaced throughout.

Due to the nature of the material the recovery of the sand layers was poor, likely due to blowout of the sands into the fractured limestone around the borehole. Low recovery in the Hythe Formation was recorded in BH101 (7.0 – 10.0 m bgl), BH104 (1.5 – 2.5 m bgl) and BH203 (8.2 – 10.5 m bgl) between approximately 88 to 94 m AOD, and in BH102 and BH103 (9.0 – 10.0 m bgl) at 61 to 64 m AOD. These may represent more fractured horizons within the limestone, or a greater proportion of weakly cemented sands.

Depth to the top of the Hythe Formation varies considerably across the site, generally less than 1 m bgl in the south of the site around the former airport and increasing to a maximum depth of 7.1 m in BH102 at Somerfield Court Farm in the northwest of the site (beneath the Sandgate Formation). It was not encountered at BH105 indicating that the top of this strata is deeper than 10 m bgl in the northeast of the site.

7.2.8 Atherfield Clay Formation

The Atherfield Clay was encountered in the northwest of the site, in TP218 and TP220 at 1.3 m and 0.2 m bgl (57.3 and 61.6 m AOD respectively). The Atherfield Clay is shown on the geological map outcropping along the East Stour River in the northwest, but it was not encountered where mapped further upstream at BH209 which was drilled straight into the underlying Weald Clay Formation.

The Atherfield Clay Formation was also recorded below the Hythe Formation in BH104 in the south of the site, at 6.8 m bgl (86.6 m AOD) and is shown outcropping at approximately 90 m AOD on the Greensand Escarpment 1.8km to the south of BH104.

The formation was described in the log for BH104 as very stiff grey sandy CLAY to extremely weak weathered mudstone. In the trial pits in the northwest it had weathered to a greyish brown sandy clay. A total of 3.15 m thickness was penetrated by BH104 before the borehole terminated at its scheduled depth. The Atherfield Clay is reported to attain thicknesses of 20-40 ft. (6 to 12m) [13].

7.2.9 Weald Clay Formation

The Weald Clay Formation was only encountered in BH209, between 3.76 m and 10.5 m bgl (54.1 and 37.4 m AOD). It was described as a firm to stiff blue grey silty clay, with closely spaced fissures at the top. The total thickness of this formation is given as 122 m at Hythe, 4 km to the east of the site [10].

7.3 Groundwater Conditions

7.3.1 Groundwater Strikes

Rotary drilling was carried out with an air-water mist flush in order to observe any significant groundwater entry to the boreholes.

Groundwater strikes were encountered at:

- BH103 at 1.8 m bgl, within sandy clay **Head Deposits**, rising to 1.7 m bgl in 20 minutes;

- BH104 at 4.0 m bgl, within weathered **Hythe Formation** sands, rising to 3.8 m bgl in 20 minutes;
- BH105 at 4.2m bgl, within weathered **Sandgate Formation** sands, rising to 4.0 m bgl in 20 minutes;
- WS104A at 0.3m bgl, within **Made Ground**, rising to 0.2 m bgl in 5 minutes;
- WS104 B at 0.15m bgl, within **Made Ground**, rising to 0.1 m bgl in 5 minutes;
- WS107 at 2.85 m bgl, within sandy **Head Deposits**, rising to 2.0 m bgl in 20 minutes;
- BH206 at 5.2 m bgl, within the **Sandgate Formation**, rising to 3.19m bgl in 20 minutes;
- BH207 at 2.2m bgl, within fine grained **Head Deposits**, no rise recorded.

In addition, groundwater seepages were noted within window sample holes WS103, WS104C, WS105, WS106, WS108, WS109 and WS112, all within the Head Deposits, and BH209 in Alluvium. No significant groundwater was encountered within the trial pits.

Three rounds of groundwater monitoring were carried out following each phase of drilling works. Resting groundwater depths were recorded for the Arcadis exploratory holes installed with groundwater standpipes. Monitoring dates were 31st August and 8th and 15th September 2017, and 19-20th, 26 September, and 11th October 2018. Groundwater levels in existing boreholes BH1 to BH10 (PBA 2008 [15]) were also monitored on 8th September 2017 and 11th October 2018.

Groundwater strikes, and levels are summarised in Table 10. Water strikes during drilling are shown on the exploratory hole logs [25] [26] and groundwater levels during monitoring are detailed in Appendix H.

Table 10 Recorded Groundwater Depths and Elevations

Strata	Groundwater strikes during drilling		Groundwater rest level during monitoring		Comment
	m bgl	m AOD	m bgl	m AOD	
Made Ground	WS104A 0.3 WS104B 0.15 WS111 0.6	82.3 82.3 81.6	No data		-
Alluvium	None		0.64 (BH209) to 1.98 (BH207)	56.5 (BH209) to 66.85 (BH207)	BH207 and BH209 also screen Head Deposits and Weald Clay respectively.
Head Deposits	BH103 1.80 WS107 2.85 BH207 2.20	68.5 65.6 66.1	0.93 (WS105) to 2.67 (WS108)	66.2 (WS107) to 71.6 (WS108)	Standpipes in WS103, WS104C, WS112, WS202 and WS203 were dry on all monitoring rounds.
Sandgate Formation	BH105 4.2 BH206 5.2	75.8 66.9	2.25 (BH206) to 4.68 (BH208)	60.9 (BH208) to 77.1 (BH105)	-
Hythe Formation	BH104 4.0	90.6	1.48 (BH103) to 11.39 (BH6)	68.4 (BH103) to 94.4 (BH9)	BH101 and BH102 were dry on 1 and 3 monitoring rounds respectively. BH201, BH203, WS201, BH3, BH7, BH8 and BH10 were dry on all rounds.

7.3.2 BRE 365 Soakaway Testing

In order to obtain infiltration data for the outline drainage strategy, 22 No. soakaway tests in accordance with BRE 365 [28] were carried out in trial pits excavated in the Head Deposits and shallow bedrock across the site. Test sections were between 1.0 and 2.5 m bgl. Calculated infiltration rates (k) ranged between 1.4 x10^{-4} and 6.8x 10^{-9} m/s however all tests apart from TP219A did not reach 25% of effective depth and therefore the results should be used with caution. 15 No. soakaway tests did not record an infiltration value due to lack of measurable infiltration [25]. No compliant test was possible in TP208 due to very fast infiltration rates.

7.3.3 Deep Infiltration Testing

Information from Kent County Council has indicated that shallow soakaways in the Hythe Formation may cause washout of the sand layers, leading to ground instability (Section 12). To assess the feasibility of deeper soakaways, infiltration tests were carried out at approximately 5 m bgl in BH101, BH103, BH104 and BH204 within the Hythe Formation, and BH105 within the Sandgate Formation, in accordance with BS EN ISO 22282 [25]. Infiltration rates in the Hythe Formation were recorded between 1.2 x10^{-5} m/s at BH103 and 4.8 x10^{-7} m/s in BH104. Boreholes BH101 and BH204 did not record a value as the infiltration rate was too large to enable a measurable head of water to be generated. Borehole BH105 in the Sandgate formation recorded an infiltration rate of 1.3 x 10^{-7} m/s. Further details are presented in the factual reports in Appendix A and Appendix B and in the drainage report [24].

7.3.4 Groundwater Summary

Overall groundwater recorded in the monitoring standpipes during the return monitoring visits ranged between 56.5 m and 77.1 m AOD (0.6 m to 11.4 m bgl). Depths to groundwater were shallower in the north of the site as would be expected from the topography and location of surface water courses.

Groundwater depths in the Head Deposits ranged from 0.93 (WS105) to 2.67 m bgl (WS108). WS103, WS112, WS202, WS104C and WS203 were dry on all monitoring rounds. Groundwater within the Head Deposits is likely to be perched and unevenly distributed in the sand and gravel layers.

Groundwater elevations in the Hythe Formation in boreholes south of the A20 ranged from 89.2 to 96.4 m AOD (3.5 m to 11.4 m bgl). North of the A20 groundwater in the Hythe Formation was 66.3 to 68.8 m AOD consistent with a northwards flow direction in this stratum.

Groundwater in the Hythe Formation was shallowest at BH103 and BH207 at 1.4 m bgl around the confluence of the streams near the racecourse. Other locations recorded deeper groundwater in the Hythe Formation and some were dry to a significant depth (e.g. BH101, 9.9 m bgl; BH10 12.7 m bgl; BH102 9.6m bgl).

Groundwater in the Sandgate Formation in BH105 in the northeast of the site was recorded between 60.9 m and 77.1 m AOD (2.3 to 4.7 m bgl).

7.4 Evidence of Contamination

A hydrocarbon odour was noted between 0.0 and 0.4 m bgl in TP113, located in the southeast of the lorry park. Potential Asbestos Containing Material (ACM) was observed at 1.0 m bgl in TP203 located in the north of the former airport. No visual or olfactory evidence of contamination was recorded in any other exploratory hole.

On-site headspace screening for Volatile Organic Compounds (VOC) was carried out with a Photo Ionisation Detection (PID) on 305 soil samples from 48 exploratory holes. The majority of readings were below the limit of detection (<1 ppm) with the exception of three readings (max. 19.2 ppm) from BH203 at 1.5 m to 4.2 m bgl within the Head Deposits. This is considered likely due to interference rather than organic contamination as no visual or olfactory evidence was observed and no VOCs were detected in standpipe headspaces during return gas monitoring.

As discussed in Section 7.1, the potential contaminant source areas are mostly outside the development area and therefore most of the exploratory holes targeted contaminant pathways for gas or groundwater migration rather than sampling of the off-site potential source zones.

8 GEO-ENVIRONMENTAL ASSESSMENT - SOIL

8.1 Soil Analysis

To inform the preliminary human health risk assessment 78 No. soil samples were analysed from 58 No. exploratory holes, taken from depths ranging from 0.0 to 3.0 m bgl. Sampling locations were targeted at potential contaminant sources identified by the desk study, or within the site at the nearest point to off-site sources.

All soil samples were tested for:

- Asbestos (screen and identification)
- 76 No. Soil samples were tested for:
- pH
- Cyanide (total and free)
- Fraction of Organic Carbon (FOC)
- Total Phenols
- Speciated Polycyclic Aromatic Hydrocarbons (PAH EPA16)
- Heavy metals (Arsenic, Boron, Cadmium, Chromium (hexavalent), Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc)

45 No. soil samples were tested for:

- Speciated Total Petroleum Hydrocarbons (TPH CWG including BTEX and MTBE)
- 1 No. soil sample was tested for:
- Volatile Organic Compounds (VOC)
- Semi-Volatile Organic Compounds (SVOC)
- 1 No. soil sample was tested for:
- Explosive suite

8.2 Tier 1 Soil Assessment

As the project is at masterplanning stage, the proposed land use layout (high and low density residential, commercial, public open space, etc.) is preliminary and likely to change. Therefore, Generic Assessment Criteria (GAC) for a conservative land use (a residential with plant uptake scenario) has been selected for the entire site, at this stage, for the Tier 1 human health risk assessment.

All the soil chemical data has been screened against the current LQM/CIEH Suitable for Use Levels (S4UL) [29] for residential land use with plant uptake. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been adopted [30].

A Soil Organic Matter (SOM) content of 1% has been used in the assessment. This is slightly conservative as the average Fraction of Organic Carbon (FOC) for all the samples is 0.011 (converted to 1.91% SOM).

Table 11 summarises the contaminants that were recorded above the GAC. An exceedance of the GAC does not necessarily mean there is a significant risk to a receptor, as a contaminant linkage would need to be present. Where contaminant concentrations in soils sampled are below GAC they are considered unlikely to pose a significant risk.

Table 11 Summary of GAC Exceedances in Soils

Contaminant	GAC (mg/kg)	No. of exceedances / No. of tests	Concentration (mg/kg)	Samples exceeding
Asbestos (Not quantified at this stage)	NA	4 / 77	Chrysotile (loose fibres)	WS105 0.1m (TS)
			Amosite (loose fibres)	TP205 0.7m (MG) HD201 0.0m (TS)
			Chrysotile (cement debris)	TP203 1.0m (MG)
Benzo(a)anthracene	7.2	4 / 76	12 8.4 89 25	TP113 0.3m (MG) WS109 0.1m (TS) TP206 0.0m (TS) TP206 0.2m (HD)
Benzo(b)fluoranthene	2.6	8 / 76	12 6.2 9.8 3.5 2.9 4.7 98 25	TP113 0.3m (MG) WS101 0.5m (MG) WS109 0.1m (TS) WS110 0.05m (TS) HD201 0.0m (TS) TP205 0.7m (MG) TP206 0.0m (TS) TP206 0.2m (HD)
Benzo(a)pyrene	2.2	8 / 76	19 5.2 8.3 2.9 2.5 4.1 84 26	TP113 0.3m (MG) WS101 0.5m (MG) WS109 0.1m (TS) WS110 0.05m (TS) HD201 0.0m (TS) TP205 0.7m (MG) TP206 0.0m (TS) TP206 0.2m (HD)
Dibenz(a,h)anthracene	0.24	9 / 76	3.1 0.43 0.79 0.27 0.29 0.38 0.94	TP113 0.3m (MG) WS101 0.5m (MG) WS109 0.1m (TS) WS110 0.05m (TS) WS105 0.1m (TS) HD201 0.0m (TS) TP205 0.7m (MG)

Contaminant	GAC (mg/kg)	No. of exceedances / No. of tests	Concentration (mg/kg)	Samples exceeding
			98 25	TP206 0.0m (TS) TP206 0.2m (HD)
Benzo(ghi)perylene	32	1 / 76	44	TP206 0.0m (TS)
Chrysene	15	2 / 76	69 17	TP206 0.0m (TS) TP206 0.2m (HD)
Indeno(1,2,3-cd)pyrene	27	1 / 76	42	TP206 0.0m (TS)
Lead	200	1 / 76	340	WS110 0.05m (TS)

MG = Made Ground, TS = Topsoil, HD = Head Deposits, NA = No GAC applicable

As summarised in Table 11 and Appendix F, most samples recorded contaminant concentrations below the GAC in the Made Ground and topsoil samples. Exceedances of GAC were not generally recorded for metals or inorganic contaminants, nor in samples from the superficial Head Deposits.

Preliminary indicators are thus that the development is not affected by severe contamination constraints.

Elevated concentrations of PAH were recorded in TP206 at 0.0m bgl (718 mg/kg total PAH16), TP113 at 0.3m bgl (133 mg/kg) and WS109 0.1m (70.8 mg/kg). GAC for seven common PAH contaminants were exceeded, although generally by a small margin (<50x the GAC).

TP206 is located in the north of the former airport, within a potential area of waste disposal (Table 11). The trial pit log recorded 0.15 m of Topsoil, described as black silty sand, over Head Deposits (clayey sand). No significant signs of hydrocarbon contamination are recorded but minor concentrations of PAH indicate the topsoil in this area may contain ash or other combustion products from historical land use within the area.

TP113 is located within the lorry park (former quarry and cement plant), and the elevated PAH and TPH concentrations recorded are consistent with the hydrocarbon odour noted on the log, and results of previous investigations [14] summarised in Section 3.2.

TPH was detected in all Made Ground samples in TP113 (within the lorry park/ former cement & asphalt works) down to 3.0 m bgl. However, the concentrations were all below the GAC and showed a declining trend with depth. Only heavier-end hydrocarbon bands (EC>12) were above detection limits, which is more indicative of historical (weathered) hydrocarbon contamination, rather than recent fuel spillages. In contrast, higher soil concentrations of DRO were recorded up to 7,300 mg/kg in the lorry park area in 2005; similarly elevated soil hydrocarbon concentrations may still be present in areas not sampled by the recent ground investigation.

A sample from TP113 was tested for VOCs and SVOCs but were all below detection except for the PAH compounds in the SVOC suite.

WS109 is located in a grassed area between the A20 to the south and an office building to the north, near the junction with Stone Street. The origin of the elevated TPH and PAH from the sample at 0.1m bgl is unknown. No visual or olfactory impacts were recorded in the borehole log. A pollution incident was recorded by the EA in 2001, located in the car park 100 m to the north of WS109, relating to a diesel spill (minor impact to water). The area around WS109 may have been similarly affected by fuel runoff from the car park. As this area is not proposed for redevelopment in the current masterplan, it is not considered to be a significant impact in the context of the scheme.

Chrysotile asbestos fibres were identified in topsoil from WS105. This is located to the rear of the vehicle repair shop at the Airport Café. Airborne asbestos fibres from brake dust etc. is considered a possible source of the fibres. No visible asbestos was recorded on the borehole log. The current masterplan shows medium density housing to the north of the airport café.

WS110 (0.05m bgl) recorded exceedances of the GAC for benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene and lead. No anthropogenic material or signs of contamination were recorded in the topsoil in the borehole log. This borehole is located at Folkestone Racecourse, adjacent to the above ground gas tank, electrical substation, and waste storage areas. The proposed use in the masterplan is shown as green infrastructure.

Minor exceedances of GAC for benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene were recorded in WS101 (0.5m bgl), located just inside the field opposite the entrance to Lympne Industrial Park. Road runoff is considered the most probable cause although deeper Made Ground containing brick and concrete to 1.2m bgl suggests previous development or construction waste disposal, possibly associated with the airport, may have taken place.

Hand dug pit HD201 was located at the former rifle range in the southeast of the site. Only minor anthropogenic material was noted in the log [26].Minor exceedances of PAH were recorded in the surface soils at this location however no significantly elevated concentrations of heavy metals or other potential contaminants such as explosives were recorded. It is noted that this area is heavily overgrown and therefore the investigation coverage of the former range was limited to this single exploratory hole. Explosive residues may also be present in other areas of the former airport.

TP205 was excavated into the soil bund to the east of Lympne Industrial Estate. No significant indictors of contamination were recorded in the borehole log but minor exceedances of three PAH compounds were recorded along with loose fibrous asbestos debris (amosite). Other trial pits in the above ground bunds (TP203, TP204, TP227) did not record any GAC exceedances.

9 GEO-ENVIRONMENTAL ASSESSMENT - CONTROLLED WATERS

9.1 Summary of Groundwater Analysis

Groundwater samples were taken from all standpipes which had sufficient water to sample. Standpipes installed during Phase 1 were sampled on 31st August 2017, and standpipes installed during Phase 2 were sampled on 19th and 20th September 2018.

The response zones for Phase 1 standpipes were within the Head Deposits (WS105, WS106, WS107 & WS108), the Hythe Formation (BH103 & BH104), and the Sandgate Formation (BH105). For Phase 2 the response zones were across the Alluvium, Head Deposits and Hythe Formation (BH207), Head Deposits and Sandgate Formation (BH206, BH208), Alluvium and Weald Clay (BH209) and deeper within the Hythe Formation in BH202 and BH204.

The objectives of the groundwater sampling were to provide a preliminary assessment of groundwater quality across the site, to identify significantly polluted groundwater which may impact the masterplan and, obtain baseline water quality data.

A total of 14 No. groundwater samples were analysed for:

- pH and Alkalinity
- Cyanide (total and free)
- Sulphates
- Dissolved heavy metals (Arsenic, Boron, Cadmium, Chromium (hexavalent), Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc)
- Speciated Phenols
- Speciated PAH (EPA16)
- Speciated TPH (TPH CWG including BTEX and MTBE)
- 7 samples were also analysed for:
- Calcium and dissolved organic carbon

9.2 Tier 1 Initial Screening Assessment

The groundwater samples were screened against Water Quality Standards (WQS) as an initial check on contaminant concentrations. The WQS are derived from published UK Drinking Water Standards (DWS) [31] and Environmental Quality Standards (EQS) [32].

DWS are protective of the water quality at the consumers tap and EQS are protective of the water quality of surface waters; therefore, the direct comparison with the groundwater concentrations below is considered a conservative assessment.

Where the EQS varies depending on the alkalinity of the surface water receptor a value of <50 mg $CaCO_3$/l has been used for the initial assessment as a conservative option.

Results of the groundwater analysis and screening are shown in Appendix G.

Table 12 Summary of WQS Exceedances in Groundwater

Contaminant	WQS (µg/l)	No. of exceedances / No. of tests	Concentration (µg/l)	Samples Exceeding	Water body
Cadmium	0.08 (EQS) 5.0 (DWS)	1 / 14 0 / 14	0.23	WS108	Head Deposits

Contaminant	WQS (µg/l)	No. of exceedances / No. of tests	Concentration (µg/l)	Samples Exceeding	Water body
Mercury	0.05 (EQS) 1.0 (DWS)	4 / 14 0 / 14	0.25 0.07 0.09 0.29	BH104 WS107 BH103 BH204	Hythe Formation Head Deposits Hythe Formation Hythe Formation
Nickel	14.3 (EQS*) 20.0 (DWS)	2 / 14 2 / 14	30.0 24.0	WS108 BH204	Head Deposits Hythe Formation
Zinc	22 (EQS) 3,000 (DWS)	1 / 14 0 / 14	87	WS108	Head Deposits

* Site-specific PNEC calculated using mBAT bioavailability tool using assumed values for Ca (4 mg/l), DOC (5 mg/l) and pH (7).

In general, the groundwater analysis indicated that contaminant levels were low in all in the samples. No hydrocarbons or phenols were above method limit of detection. Several heavy metals were recorded above the EQS set for the protection of surface water ecosystems, but these were generally minor exceedances (recorded concentrations were the same order of magnitude as the EQS) and were all below the DWS (with the single exception of nickel).

The groundwater sample with the most and highest WQS exceedances was WS108, taken from groundwater in the Head Deposits at Folkestone Racecourse. This finding may reflect localised heavy metal contamination around the waste and fuel storage areas.

Low concentrations of dissolved mercury were detected in groundwater in the Head Deposits and Hythe Formation in BH204 and BH104 in the former airport, and BH103 and WS107 to the west of the racecourse. Mercury was historically used in electrical equipment and batteries. This may indicate a potential source of dissolved mercury in the south of the site, as the groundwater divide is located near the site boundary and therefore is less likely to be an off-site upgradient source. The greatest dissolved mercury concentrations were recorded in the south of the site and decrease along the groundwater flow path towards the River East Stour to the north. All the dissolved mercury concentrations recorded were substantially below the DWS criteria of 1 µg/l.

Whilst several heavy metals have been recorded in groundwater above EQS, these criteria are protective of surface water ecology and therefore not a concern unless they are directly impacting surface waters. Shallow groundwater is likely to be hydraulically connected to the local surface water bodies, but the concentrations recorded in groundwater – at less than 10x the EQS – are unlikely to be high enough to cause significant deterioration of surface water quality. Except for nickel none of the dissolved metals are above drinking water standards. While additional analysis of surface water and groundwater for dissolved metals would be worthwhile, based on the data available they are not considered a significant concern in the context of the proposed development.

10 GEO-ENVIRONMENTAL ASSESSMENT - GROUND GAS

10.1 Gas Monitoring Summary

Potential sources of ground gas have been identified in Section 6.1, including the Lympne Industrial Park landfill and the Otterpool quarry backfill. The Alluvium deposits associated with the watercourses on site are also a potential source of ground gas.

Twelve Phase 1 exploratory hole locations installed with monitoring standpipes were monitored for ground gas on 31st August and 8th and 15th September 2017. These comprised boreholes BH101 to BH105, and the seven window sampled boreholes targeting shallow soils near to the potential ground gas sources shown in Table 7. The existing PBA boreholes BH1-BH10 screening the Hythe Formation in the south of the site were also monitored on 8th September 2017.

Three additional gas monitoring rounds were carried out in 2018. Phase 2 boreholes BH201 to BH204 and BH206 to BH209 and WS201 to WS203 were monitored on 19th-20th September, 26th September and 11th October. In addition, Phase 1 monitoring standpipes and PBA standpipes were monitored where these were in working order.

Concentrations of methane (CH_4), carbon dioxide (CO_2), oxygen (O_2), carbon monoxide (CO), and hydrogen sulphide (H_2S) were recorded. Atmospheric pressure and borehole pressure and flow were also recorded. The results of the monitoring are shown in Appendix H and summarised in Table 13.

Table 13: Summary of Gas Monitoring Results

Relative Pressure (mbar)	Borehole flow rate (l/h)	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	H_2S (ppm)	CO (ppm)
-11.8 to +0.4	-0.9 to +0.6	<LOD to 0.1	<LOD to 4.7	3.4 to 21.0	<LOD	<LOD to 15

Atmospheric pressure recorded on-site during the monitoring was:

- 1007-1010 mbar on 31st August 2017
- 989 - 994 mbar on 8th September 2017
- 999-1001 mbar on 15th September 2017
- 1002-1009 mbar on 19-20th September 2018
- 1021-1027 mbar on 26 September 2018
- 999-1009 mbar on 11th October 2018

Rising and falling trends in atmospheric pressure during the monitoring rounds are shown in Appendix H. Monitoring has taken place during a low and falling pressure event which produces higher risk conditions for ground gas migration.

It is noted that groundwater level was above the top of the standpipe screen in BH103 on all six occasions, on one of three rounds for BH209, and on two of six occasions in WS105. The gas concentrations and borehole pressure recorded at these times may not be representative of the surrounding ground gas conditions.

10.2 Ground Gas Risk Assessment

A ground gas risk assessment has been carried out using the current guidance CIRIA C665 *Assessing Risks Posed by Hazardous Ground Gases to Buildings* [33] and BS8485 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings* [34].

As the proposed development is at masterplanning stage, building types and locations are subject to change. Therefore, two common approaches have been used: the Boyle and Witherington (NHBC) [35] approach for low rise housing with a ventilated underfloor void (Situation B), and the modified Wilson and Card system [33] for all other building types (Situation A).

The gas regime will vary across the development area depending on the distance to gas generation sources, geology and groundwater conditions. It will also vary with time as atmospheric conditions affect gas generation and emission rates. However, as a preliminary assessment, the gas monitoring data from all locations has been combined and maximum values for the entire site used, giving a conservative risk estimate.

For both approaches a Gas Screening Value (GSV) is calculated using the following equation:

GSV (l/h) = max. borehole flow rate (l/h) x max. ground gas concentration (v/v %) / 100

Using the above equation, the following GSVs have been calculated:

- Methane GSV = 0.0006 l/h (0.1% CH4 and 0.6 l/h)
- Carbon Dioxide GSV = 0.028 l/h (4.7% and 0.6 l/h)

Based on the monitoring data, both the methane and carbon dioxide GSV are classified as ‘Green’ under the NHBC traffic light system for Situation B (low rise housing with ventilated underfloor void) [35]. This indicates a negligible gas regime has been identified and based on this, gas protection measures are not necessary.

For all other types of development (Situation A) the calculated GSV correspond to Characteristic Situation 1 (“very low risk”) [33].

The concentrations of carbon monoxide and hydrogen sulphide recorded are not considered indicative of a significant risk to the development.

The generally low methane and carbon dioxide concentration are characteristic of natural soils with a low organic content or typical Made Ground. They suggest that the potential gas sources identified are of low gas generating potential. This is consistent with the information available on the landfill from the EA stating inert waste was deposited at the Lympne Industrial Park Landfill (Section 5.2). The low risk finding is also consistent with records of quarry spoil backfill at Otterpool Quarry.

The results of the gas risk assessment suggest that ground gas protection measures are not likely to be required for the majority, if not all, of the development [34]. The Local Authority should be contacted at detatiled planning stage to determine whether they are satisfied with the current gas monitoring

However, more detailed and targeted investigation should be undertaken at a later stage of design to confirm the preliminary CS1 and Green classifications. This should include a longer period of monitoring during adverse conditions for gas emission (falling atmospheric pressure).

11 REGULATORY ASPECTS, WASTE AND RE-USE OF MATERIAL

The proposed development is anticipated to generate soil and some rock materials, from excavations for building foundations and services, ground reprofiling for drainage, and construction of roads and other infrastructure. These soils will be predominantly uncontaminated natural soils. The scheme landscape design will likely need to include for beneficial reuse of such materials.

However, if there is no scheme requirement for certain materials, they may become waste.

EU Directives, UK Government policy and regulations require that construction waste to landfill is minimised. The waste hierarchy should be considered during the design: initially the creation of waste soil should be minimised, then where possible excavation arisings should be re-used on site as either engineering fill or landscaping fill. This approach would be beneficial to the scheme as it will potentially save costs on importing material on to site during the development and reduce fees for disposing of materials as waste. The reuse of soils on other sites may be possible. Disposal to landfill should be the last resort.

Contaminated soils, or soils that are otherwise unsuitable for reuse, may be treated to enable reuse elsewhere, or disposed of to landfill. If materials become waste they must be classified as hazardous or non-hazardous to determine the correct disposal route and comply with the Waste Acceptance Criteria (WAC) for that type of landfill.

11.1 Soil Waste Assessment (Hazardous/Non-hazardous)

The location, depth, type and volume of any waste soils will not be known until the construction phase. However, as a preliminary assessment the available chemical data for the soils sampled across the site in the phase 1 and 2 ground investigations has been classified as hazardous or non-hazardous in accordance with relevant EA guidance [36]. This may assist in planning future ground investigation and provide an indication to future developers of the potential need for expensive disposal of hazardous waste.

50 No. samples of Made Ground / Topsoil and 33 No. samples of the natural superficial deposits and bedrock, were screened using HazWasteOnline™ software to determine whether excavated material represented by these samples, in circumstances where they became waste, could be classified as hazardous or non-hazardous waste.

The List of Wastes Code used in the assessment was 17 05 04: soils and stones other than those mentioned in 17 05 03 (for non-hazardous material); whilst the code for the hazardous material would be 17 05 03. Laboratory reported concentrations (dry-weight basis) were corrected for the moisture content of each sample. The results of the assessment are presented in Appendix I.

None of the 83 No. samples were classified as hazardous waste by the preliminary assessment, although asbestos detected in four samples meant that these were classed as potentially hazardous. The four samples are summarised in Table 11.

Quantification of asbestos was not carried out in the preliminary ground investigation but would need to be undertaken prior to disposal of soil from these areas. If the soil contains 0.1% or more asbestos as free and dispersed fibres than it will be classified as hazardous waste under 17 05 03. It would also be classified as hazardous if the asbestos concentration in any identifiable pieces of ACM is 0.1% or more. In that case the soil would be regarded as a mixed hazardous waste under more than one code.

The initial screen of the data indicated that 17No. samples were potentially hazardous with regards to HP3 flammable, due to the concentration of Total Petroleum Hydrocarbons (TPH) (11-1,030 mg/kg). However, this assessment has been revised to non-hazardous, because the concentration of TPH required to be flammable in soil is greater than 1,000 mg/kg, and no evidence of free-phase product was identified on the exploratory hole logs.

The remainder of the soil samples (with no asbestos detected) would be classified as non-hazardous based on the determinants analysed and would be suitable for disposal as either inert or non-hazardous waste, pending the results of WAC testing.

It should be noted that a waste management facility is likely to require testing of the actual material that is to be disposed of off-site prior to acceptance, and that there is no obligation on a landfill operator to accept the waste. Therefore, further sampling and characterisation of the actual soil material to be disposed of will be required. Soils suspected of being contaminated during excavation should be stockpiled and tested separately to avoid mixing non-hazardous and hazardous waste and minimise the volume of hazardous waste.

11.2 Soil Materials Management Summary

Based on the assessment of the chemical results from the 83 samples of Made Ground and natural soils, most of the near-surface soils on the site are likely to be chemically suitable for reuse on site. Soils impacted by asbestos may be unsuitable for reuse and may require off-site disposal or treatment.

To comply with current environmental legislation and/or waste regulations, re-use of excavated materials is commonly undertaken via one of two routes. If materials are existing waste, or have become waste, then re-use may require regulation via Environmental Permitting (formerly Waste Exemptions).

However, on a development such as this, the hierarchy of reduce and reuse should be applied throughout the design process, such that suitably clean and geotechnically suitable materials do not become waste, i.e. re-use is pre-planned and a core part of the scheme design.

Reuse may then best be structured in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice [37]. The key principles are that soils must be demonstrated to be required and be certain of use and be “suitable for use” both chemically and geotechnically. The CL:AIRE protocol provides a robust framework to enable compliance with legislation to be demonstrated, and is acknowledged as good practice by the EA.

A Materials Management Plan (MMP) (or method statement) should be produced during the design phase for the whole scheme or each phase of development. The analysis undertaken (soils and soil leachate) during this investigation can be used to help inform the scheme MMP; supported, development phase by development phase, by additional chemical testing to demonstrate compliance. The MMP must be “signed off” by a CL:AIRE Qualified Person (QP) and a declaration submitted to the EA. A verification report should be prepared following the works to demonstrate compliance with the MMP.

Should the excavated material not be physically or chemically suitable for use, or if there is an excess of materials, the material may become waste and might need to be disposed of to landfill, or could be taken to a soil treatment hub, or to a receptor site identified under the CL:AIRE protocol. Further testing and separation of waste for off-site disposal should be undertaken during the excavation works to minimise any treatment requirements. The testing will enable the classification of material to reduce wastes sent to non-hazardous and hazardous landfill.

Arisings should be stored in an appropriate manner to retain the desired properties and prevent leaching of contaminants or fines from the material. This should be in a location on site away from watercourses. Stockpiles should be kept at a suitably height to ensure that they remain stable. If considered necessary, the stockpiles should be covered to ensure that soils do not enter surface water runoff. Suspected inert, non-hazardous and hazardous material should be stored separately where appropriate to avoid cross contamination and avoid unnecessary disposal costs.

Any imported fill or topsoil for gardens and landscaped areas etc. used for the works must be suitable for use, fit for purpose and validated as necessary.

The site contains a significant amount of agricultural land, some of which is classified as best and most versatile (BMV Grades 2 and 3a) [1]. Topsoil is a valuable resource and should be reused wherever possible. Topsoil should be handled with care to avoid degradation in accordance with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [38].

12 ENGINEERING GEOLOGY

12.1 Potential Ground Hazards

Information on natural ground hazards and has been obtained from the BGS Geosure datasets, which provide high-level information (Phase 1 level) on ground hazards on a regional scale based on the 1; 50,000 scale geological mapping. This has been combined with information on man-made ground hazards from other sources, such as Kent County Council, as summarised in Table 14.

Table 14 Summary of Ground Hazards

Hazard	Description
Collapsible ground	Low hazard associated with the fine-grained Head Deposits. Very low or no hazard elsewhere on site.
Running sands	Low hazard associated with the Alluvium and coarse-grained formations of the Lower Greensand (Hythe, Sandgate and Folkestone Formations). Very low or no hazard elsewhere on site. Information from Kent County Council indicates that 'washout', and subsequent ground instability, is often associated with the sand layers in the Hythe Formation. The weakly cemented sandstone can be washed into fractures in the limestone layers under the influence of infiltration from soakaways, leading to collapse around the soakaway [39].
Shrink-swell clays	Low hazard associated with the fine-grained Head Deposits and Weald Clay Formation. Very low or no hazard elsewhere on site.
Compressible ground	Low hazard associated with the Alluvium which is generally within 50 m of the main watercourses on the site. Very low or no hazard elsewhere on site.
Ground dissolution	No hazard, but note comment from Kent County Council considering washout risks.
Mining and quarrying	Quarrying is known to have taken place at Otterpool Manor (Section 3.1.1). No other quarries are recorded on the site. Several small pits were recorded on historical mapping in the late 1800s and early and were infilled by 1940 (Section 4.1). These are not located in proposed development areas. The site is not in an area affected by coal mining and no other mines have been identified within the site.
Landslide	The BGS records landslide deposits (Quaternary) on the south-facing scarp slope of the Hythe escarpment to the south of the site. As the slope is off-site, (with the exception of the far southwest corner) it is not considered to represent a risk to development on the site. The current masterplan does not include any development within 450 m of the southern site boundary. The majority of the site is classed as very low risk from landslide with the exception of small areas of low risk in the west of the site associated with the exposures of Atherfield Clay in the East River Stour valley
Cambering and gull cave formation	Cambering is known to occur in the Hythe Formation, where blocks tilt and move downslope due to the deformation of the underlying, less competent, Atherfield Clay Formation. This leads to the formation of subvertical fissures which are then infilled by overlying materials. These gull caves have been documented in the Maidstone area [40]. No records of gulls or similar infilled fissures are available for the site, but it is likely that any such features are confined to the south edge, near to the crest of the Greensand escarpment.

Further information on the above ground hazards in relation to potential geotechnical constraints for the Otterpool Park development is given in Section 12.3 below.

12.2 Summary of Geotechnical Testing

Preliminary in-situ and laboratory geotechnical testing has been undertaken on samples of the superficial deposits and bedrock underlying the site. The objective of the geotechnical testing was to enable basic characterisation of the engineering properties of the materials and to identify significant problematic ground conditions which may need to be considered at masterplanning stage. Further sampling and testing will be required for each phase of development to inform the design of structures and earthworks.

12.2.1 Laboratory Testing

The following laboratory tests were carried out:

- 26 No. particle size distribution by wet sieve and pipette;
- 36 No. moisture content tests (105oC drying temperature, BS1377 Part 2 clause 3.2);
- 27 No. 4-part plastic and liquid limit tests;
- 8 No. compaction tests (dry density/moisture content relationship by 2.5 kg rammer);
- 2 No. laboratory California Bearing Ratio (CBR) tests;
- 1 No. quick undrained triaxial test;
- 3 No. point load tests; and
- 17 No. BRE SD1 concrete classification tests.

The results of the geotechnical testing are presented in the Ground Investigation Reports (GIR) [25] [26]and summarised below.

SOIL CLASSIFICATION

Table 15 Summary of Soil Classification Test Results

Stratum	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Particle Size Distribution (%)				Optimum Moisture Content (%)
					Gravel	Sand	Silt	Clay	
Made Ground	12 – 31	36 – 42	21 – 28	14 - 15	-	-	-	-	-
Alluvium	16 – 37	32 – 47	17 – 30	11 – 25	1	47	43	9	-
Head Deposits	14 – 44	29 – 58	15 – 38	11 – 34	0 – 36	6 – 77	14 – 68	0 – 47	11 – 14
Sandgate Formation	27 – 29	47	32	15	0	60	40	0	-
Hythe Formation	37	44	18	26	0	45 – 69	31 - 54		23
Atherfield Clay Formation	31	52	29	23	1	38	41	20	16

POINT LOAD STRENGTH INDEX TESTS

Three point load strength index tests were carried out on intact samples from the Hythe Formation, recovered from BH202 (3.4-3.8 m and 7.5-7.77 m bgl) and BH204 (3.2-3.43 m bgl). Field descriptions were strong grey and brown fine-grained sandstone. All samples were tested to failure and recorded size-corrected point load strength indices ($Is_{(50)}$) of 2.92, 0.93 and 0.10 MPa.

The wide range of point load values recorded is likely to be due to the variable nature of the Hythe Formation, which consists of strong limestone layers interbedded with less strong, weakly cemented sandstone layers. The sample from BH204 with a low point load strength value probably represents the latter material, possibly also highly weathered as it was from just under the overlying Head Deposits. The strength results are therefore representative of the individual material types and not the rock mass as a whole, and likely to be biased towards the stronger material.

CALIFORNIA BEARING RATIO (CBR)

Two laboratory CBR tests were carried out on remoulded samples of fine-grained Head Deposits from TP202 (0.4 m bgl) and TP223 (0.6 m bgl). Maximum CBR values of 3.4% and 15.0% were recorded for the two samples.

CBR results were also reported in the PBA report for the Link Park development north of Lympne Industrial Estate [15]. Average CBR values for six samples (0.5 to 1.5 m bgl) were between 1.1% and 5% with one result of 32%.

12.2.2 In-Situ Testing

STANDARD PENETRATION TESTING

Standard Penetration Tests (SPT) were carried out in 13 No. rotary boreholes and 10 No. windowless sampled boreholes. The resulting blow counts (N value) are given in the borehole logs in the GIR and summarised in Table 16.

Table 16 Summary of Standard Penetration Test (SPT) results

Stratum	No. of tests	N value Range	N Value Mean*	Relative Density
Alluvium	5	3 – 10	6	-
Head Deposits – coarse soils	22	4 – >50	26	Very loose to very dense
Head Deposits –fine soils	33	4 – >50	15	-
Sandgate Formation – coarse soils	6	5 – 57	23.1	Loose to very dense
Sandgate Formation – fine soils	9	22 – >50	41	-
Hythe Formation (unweathered)	15	30 – >50	47	Generally rock. All but 2 tests refused.
Atherfield Clay Formation	2	>50	>50	-
Weald Clay Formation	7	19 - 36	27	-

* Tests that refused as >50 blows included in mean as 50

SPT tests results as reported on logs (uncorrected) are summarised by depth below ground level in Figure 11 below.

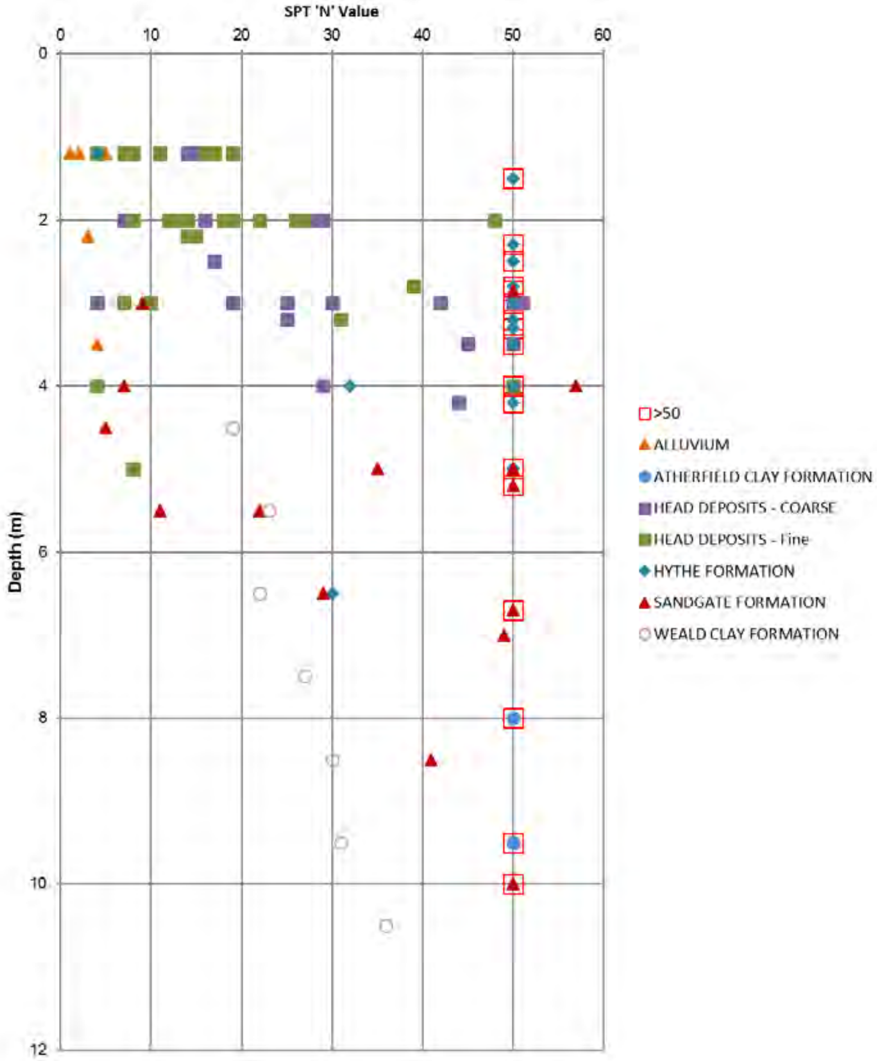


Figure 11 – Summary of SPT results

As shown in Figure 11, SPT values in Alluvium were generally <10 indicating soft ground conditions where these deposits are located. Head deposits comprising coarse material (sand and gravel) recorded higher N values with increasing depth (corresponding to medium dense to dense relative density below 2m bgl), while N values for fine-grained (clay and silt) materials were more variable. The Hythe Formation recorded N values of >50 even at shallow depths (1.5 m bgl in BH104) indicating shallow bedrock of high strength in the south of the site. N values in the Sandgate, Atherfield Clay and Weald Clay Formations were lower at shallow depths, increasing to >50 in the first two strata by 6 to 8 mbgl.

HAND VANE TESTING

Seventeen field hand vane tests were carried out on cohesive material from TP209 (weathered Hythe Formation), TP213 (Sandgate Formation), TP220 (Atherfield Clay Formation), and TP217 & WS201 (Head Deposits). The tests were carried out using a Pilcon hand shear vane with a cruciform vane of 19 mm diameter following the method outlined in the Ground Investigation Report [26]. Due to the nature of the samples tested, the results are indicative for assistance in determining soil consistency for logging purposes only and should not be used to classify soil strength.

12.3 Engineering Discussion

12.3.1 Proposed Construction

Currently the project is at an early stage and therefore the final layout and form of development is subject to change. The purpose of this investigation is not to obtain information for the design of roads or structures, but to identify at an early stage ground characteristics and comment on those that may require non-standard engineering solutions for the types of development outlined in the current masterplan (Section 1.4).

Further investigation will be required to provide information for design of pavements, buildings, structures etc. once the form and location of these are finalised.

It should be noted that the samples tested will not be necessarily representative of the locations or depths of the eventual foundations, and therefore additional sampling and testing will be required prior to detailed design stage.

12.3.2 Subsurface Obstructions

Several previously developed areas have been identified within the site based on desk study information and historical mapping. These include the:

- Former airport buildings along the southern site boundary and west of Otterpool Lane opposite the industrial park;
- Former airport runways and taxiways;
- Former rifle range in the southeast of the site;
- Former buildings associated with WWII use (e.g. bunkers which may have been infilled);
- Demolished buildings to the southwest of Westenhanger station (current racecourse); and,
- Former quarry buildings and cement/asphalt works foundations and tanks in the current lorry park (known hydrocarbon contamination – Section 3.2).

Other structures associated with the former airport and racecourse may also be present.

The potential for remnant foundations and other abandoned structures at these locations should be considered during the design and construction phases. Ground disturbance caused by the removal of historical structures may increase the thickness of any Made Ground present.

12.3.3 Building Foundations

Potential foundation solutions for buildings and other structures will be dependent on the extent and thickness of any Made Ground and the geotechnical properties of the superficial deposits and bedrock.

MADE GROUND

Made Ground is generally considered unsuitable for foundations due to its variable composition and its potential for high total and differential settlement. Non-standard foundations (e.g. piles or raft solutions) would likely be required for any areas of significant Made Ground thickness.

The fill depth at Lympne Industrial Park landfill is not known. The maximum depth of Made Ground in this area was 0.6m bgl in BH202, which is shown within the landfill. It may be that the majority of the fill is located in the vegetated area between to the north of this borehole. It is noted that the current masterplan shows the landfill area as green space.

FINE SOILS

An estimate of the undrained shear strength (c_u) of clay has been calculated from the uncorrected ‘N’ value and the plasticity index of the fine-grained materials based on the relationship by Stroud (1974) [41].

$$c_u = f_1 N$$

Table 17 Estimated Mean Undrained Shear Strength of Clay

Material	No. of PI tests	Mean Plasticity Index (PI) %	Corresponding value of f_1	Mean N value*	Estimated mean Undrained Shear Strength (c_u) kPa
Alluvium	5	17	5.0	6	30
Head Deposits – fine soils	17	20	4.8	15	72

* Fine grained material only

Based on the initial assessment, the fine-grained Head Deposits are likely to be suitable for supporting shallow foundations for low rise buildings that impose moderate loading. The Alluvium is likely to be marginal in terms of its load settlement characteristics and further testing and assessment will be required. It is noted that the Alluvium is confined to the areas around the surface watercourses and no buildings are shown in these areas in the current masterplan.

The coarse-grained Head Deposits are also likely to be suitable for supporting shallow foundations for low rise buildings that impose moderate loading.

Throughout the superficial deposits the SPT results are variable across the site, and therefore settlement characteristics should be confirmed with additional testing.

BEDROCK

Where superficial deposits are absent or of shallow thickness, foundation level will be within the bedrock, predominantly the Hythe Formation.

Where the Hythe Formation is present at shallow depths beneath the ground (centre of the site south of the A20), bearing capacity is likely to be sufficient to support foundations for residential low rise buildings, based on the results from the strength index tests and SPT testing reported above. However, excavations for deep foundations may be difficult and require heavier equipment (Section 12.3.5).

Excavations should be inspected by a suitably qualified geotechnical engineer to confirm that a suitable formation is present.

12.3.4 Pavements

Laboratory CBR tests from samples of the Head Deposits in the south of the site have been undertaken during the recent and previous investigations. Recorded values were mostly between 2.5% and 5%. Relevant guidance (IAN 73/06) [42] recommends an equilibrium CBR of 3% for a sandy clay of plasticity index 10-20% for a low water table in poor construction conditions. Therefore, based on the available data, extensive ground improvement for standard pavement construction in this area is unlikely to be required, although limited enhancement measures for any soft spots may be necessary.

However, design CBR values and frost susceptibility for all areas of the site will need to be established from more detailed investigation at the design stage. Variations in the subgrade material, especially in areas of Alluvium, may mean that a lower CBR will be encountered.

12.3.5 Excavations and Shallow Groundwater

Forty trial pits (TP101 to TP113 and TP201 to TP228) were excavated to depths of between 0.4 m and 3.4 m bgl. Stability of the pit sides was generally good in the short term, except for TP105 west of the racecourse which encountered Alluvium to 1.4 m bgl and Head Deposits (sands and gravels) to the target depth of 2.5 m bgl. Poor side stability was also noted in TP209 and TP222, located in the south of the site in weathered Hythe Formation before terminating on stronger bedrock material. A collapse was also noted in TP218 located in the northwest of the site which was excavated to scheduled depth at 2.7m bgl within Atherfield Clay Formation. Excavations deeper than 0.5 m should therefore be battered back or shored if person entry is required or they are to be kept open for a long period of time.

No significant groundwater entry was recorded during excavation of the trial pits, however shallow groundwater strikes (<2 m bgl) were recorded in WS104(A&B), WS111 and BH103 (Table 10). Groundwater control may therefore be required for any excavation.

Excavatability was reported to be good through the superficial deposits but fifteen trial pits were terminated prior to target depth due to refusal on bedrock (Hythe Formation). These were generally located south of the A20 in the centre of the site, confirming that rockhead is shallow in this area (refusal depths were 0.4 m to 3.4 m bgl using an 8 tonne JCB 3CX with toothless bucket). The top of the Hythe Formation was recorded at <1.0m bgl in BH104, TP209, TP206, BH202, TP222 and TP221.

Due to the stronger limestone layers in the Hythe Formation (max. $Is_{(50)}$ = 2.92 MPa), excavation may be difficult with conventional equipment, depending on the local ratio of limestone and sandstone, presence of discontinuities and the degree of weathering. Information from rotary cored borehole logs (BH101 to BH105) indicates that the limestone contains very closely to closely spaced (20 to 200 mm) subhorizontal and subvertical fractures which could be exploited during excavation.

12.3.6 Earthworks and Material Reuse

Soil arisings from excavations for landscaping, foundations or drainage features may be reused on site as fill if geotechnically suitable, and if chemically suitable for reuse (see Section 11).

Six laboratory compaction tests were carried out on samples of the Head Deposits to determine the Optimum Moisture Content (OMC) for compaction. The optimum moisture content for the samples ranged from 11 to 14%, and the material had relatively low sensitivity to moisture changes. Initial (natural) moisture contents ranged from 11 to 21%, thus some materials are wet of optimum and would require conditioning.

Compaction tests in areas of proposed detention basins (TP218 and TP221) indicate that the OMC is 16% for Atherfield Clay Formation and 23% for weathered Hythe Formation. Natural moisture contents were 19% and 28%, (and 31% and 37% in separate samples of these materials) and therefore are also wet of optimum.

The fine-grained materials are therefore likely to be suitable for reuse as general or landscape fill, if handled and stored appropriately. Further testing will be required to determine whether they can be reused as engineering fill.

12.3.7 Other Ground Conditions

GROUND COLLAPSE

The Head Deposits are shown as containing possibly collapsible ground when loaded and saturated (low risk) by the BGS. However, no significant thicknesses of loessic soil (wind-blown silt deposits) were encountered in the Head Deposits during the ground investigation, and therefore no further assessment of collapse risk is considered necessary.

RUNNING SANDS

Running sand conditions occur when loosely packed sand layers are fluidised by flowing water. Information from the local authority indicates that this has occurred where surface water is drained to the Hythe Formation via soakaways etc. causing washout of the sand layers and consequent ground settlement [39]. The recovery of the sand layers within the Hythe Formation in the rotary boreholes BH101 to BH104 and BH201 to 204 was poor (Section 7.2.7) and therefore thicknesses are difficult to determine, but may be around 0.2 to 0.6 m thick [15].

Where the top of the Hythe Formation is close to the ground surface (predominantly in the south of the site) the risk of collapse due to surface water infiltration is highest. Design of soakaways and other drainage features should be sited away from buildings and deep bored soakaways may be required to reduce the risk. Further details will be given in the outline drainage report [3].

SHRINK SWELL CLAYS

Whilst all clays are susceptible to shrinkage and swelling, some clays are highly susceptible to volume changes under varying moisture conditions, which may pose a hazard to foundations and subsurface structures. The modified plasticity index I'_p has been used to assess the potential for ground shrinkage or swelling.

$$I'_p = I_p \times (\%<425\mu m) / 100\% \qquad \text{(BRE, 1993)}$$

Table 18 Volume Change Potential

Material	Number of tests	Plasticity Index *Ip* (%)	Modified Plasticity Index *I'p* (%)	Volume change potential
Alluvium	5	11 to 25	9 to 25	Low to medium
Head Deposits – fine soils	17	11 to 34	11 to 34	Low to medium
Sandgate Formation	1	15	15	Low
Atherfield Clay	1	23	23	Medium

There are many existing mature trees on the site. Addition or removal of trees will affect the soil moisture content and may contribute to subsidence or heave. The recommendations in NHBC Standards Chapter 4.2, should be incorporated into the design [43].

The full results of the plasticity testing are given in the laboratory certificates in the Ground Investigation Report [25] [26]. The samples are classified as clays and silts of low to medium plasticity when plotted on a plasticity chart (Section 12.2.1).

12.3.8 Drainage

Soakaway tests in accordance BRE365 were undertaken in trial pits TP101 to TP112 to determine whether infiltration rates may allow for infiltration to dispose of surface water from the proposed development. Further details can be obtained from the Drainage Report [24].

12.3.9 Buried Concrete

As part of the preliminary ground investigation, chemical testing was carried out on selected materials to provide a preliminary assessment of the potential for aggressive ground conditions. Elevated sulphate concentrations may under some conditions cause the deterioration of concrete in direct contact with soil or groundwaters.

The fine-grained clays and silts of the Atherfield and Weald Clay Formation, and superficial deposits derived from them are the most likely strata on the site to contain pyrite, a common source of sulphates. The recent Alluvium deposits are also a potential source of sulphates [44].

28 No. soil samples were analysed for water-soluble sulphate (2:1 leachate equivalent) and 12 No. soil samples were analysed for the full suite specified in BRE Special Digest 1 [44]. In addition, 7 no. groundwater samples were analysed for dissolved sulphate.

The Design Sulphate Class (DS) for the strata on the site are summarised in Table 19 below. The Site was assessed as a location where disturbance of pyrite-bearing natural ground could result in additional sulphate. Mobile groundwater was assumed for the assessment. Due to the large area of the site compared with the number of samples available the maximum concentration was taken as the characteristic value.

Table 19 Concrete Assessment - Design Sulphate Class

Material	Water-soluble sulphate in soil (2:1) as SO_4 (mg/l)					Sulphate in groundwater as SO_4 (mg/l)	Design Sulphate (DS) Class
	N	Minimum	Mean	Maximum	Characteristic Value		
Topsoil	8	0	13	20	20	21.0 – 173	DS-1
Made Ground	9	10	61	200	200		DS-1
Alluvium	1	0.65	0.65	0.65	0.65		DS-1
Head Deposits	23	0	34	150	150		DS-1
Sandgate Formation	1	0.16	0.16	0.16	0.16		DS-1
Atherfield Clay Formation	1	30	30	30	30		DS-1
Weald Clay Formation	1	1.3	1.3	1.3	1.3		DS-1

Based on the available samples all the strata were classified as DS-1 (lowest potential for concrete attack). The total potential sulphate (% SO_4) and groundwater pH were assessed to determine the Aggressive Chemical Environment for Concrete (ACEC) class. All locations represented by the samples tested are classified as AC-1.

The results indicate that the soils are unlikely to present a risk of aggressive ground conditions (DS-1 and AC-1). This should be confirmed with additional testing during a during development-specific ground investigation in accordance with guidance in BRE Special Digest 1 [44].

13 CONCLUSIONS AND RECOMMENDATONS

13.1 Conclusions

The objective of this report was to identify significant ground risks that may affect the feasibility or design of the overall masterplan for Otterpool Park.

No critical issues have been identified that may significantly impact the development feasibility; however, a number of potential constraints on the development that should be taken into account to avoid or mitigate against potential construction impacts have been identified. These are summarised below.

13.1.1 Soil and Groundwater Contamination and Ground Gas Risk

No visual or olfactory indicators of soil or groundwater contamination were observed and PID screening recorded low or negligible concentrations of volatile contaminants at the locations investigated.

The results of the Tier 1 soil contamination assessment suggest that most of the site does not exceed generic criteria for a residential end use. Minor exceedances of GAC for PAH and lead and loose asbestos fibres have been recorded, but evidence of gross soil contamination that may impose significant costs or constraints on the development has not been found at this stage. Further ground investigation at higher densities will be required to confirm the extent and magnitude of soil contamination and determine appropriate mitigation measures prior to any development.

The preliminary groundwater testing carried out indicates that the majority of the potential contaminants that were analysed are not of concern. Minor exceedances of water quality criteria for heavy metals were recorded in groundwater in the Head Deposits and Hythe Formation, but are not considered significant in the context of the proposed development. Low but consistent concentrations of mercury have been detected in Hythe Formation groundwater in the south of the site, potentially indicating an on-site source that has not yet been located, these are also considered unlikely to cause significant surface water quality issues.

Ground gas monitoring results indicate that the soils around the monitoring locations are of low gas generation potential. This includes locations near to the Lympne Industrial Park Landfill and the Alluvium deposits.

The Lympne Industrial Park landfill was not directly investigated at this stage, but no evidence of leachate or landfill gas migration was observed at four locations placed around the boundary of the landfill (WS102 (refused at 0.3 m bgl), WS103, WS112 and BH1). This preliminary finding is consistent with the inert classification suggested by desk study information. Further investigation is recommended at detailed design stage.

13.1.2 Soil Materials Management

Based on the assessment of the chemical results from the 34 samples of Made Ground and Head Deposits, the majority of the near-surface soils on the site are likely to be chemically suitable for reuse on site. Soils impacted by hydrocarbons from the existing lorry park were classified as potentially hazardous waste and are likely to be unsuitable for reuse without treatment; these may require off-site disposal.

13.1.3 Engineering Considerations

A limited number of buried obstructions have been recorded, at the racecourse and former cement works.

Shallow foundations are generally expected to be a suitable option for residential, lightly-loaded and low-rise structures proposed at the site, however suitable precautions should be taken in line with NHBC Foundation guidance with respect to the presence of medium volume change potential cohesive strata.

Bedrock (Hythe Formation) is present at shallow depths in the centre of the site, which may cause difficult excavation conditions. Generally, groundwater inflows in trial pits were not significant, but some groundwater control may be required during construction, with higher probability in lower lying areas in the centre and north of the site, and during wet weather.

The potential for washout of sand layers within the Hythe Formation should be considered in the design of soakaways and other drainage features.

No other geological hazards or usual ground conditions which have a high potential to significantly affect the proposed scheme have been identified at this stage.

Initial in-situ and laboratory testing has been carried out at widely spaced locations across the site. More detailed ground investigation will be required at design stage to provide adequate data and confirm the preliminary geotechnical parameters reported herein. Excavations should be inspected by a suitably qualified geotechnical engineer to confirm that a suitable formation is present.

13.1.4 Unexploded Ordnance (UXO)

Potential risks from UXO have been identified due to the historical use of the southern part of the site as a RAF base. Records indicate that this part of the site was heavily bombed in WW2 and not all dropped ordnance may have exploded or subsequently been located. In addition, pipe mines were laid beneath the runways, and while some clearance activities were undertaken, further pipe mines were uncovered in the 1950s and 1960. An abandoned bomb is recorded in the northwest corner of the site. Further details are presented in the UXO desk study in Appendix D.

The potential for undiscovered unexploded bombs (UXB) or pipe mines may present a significant constraint to the development. The current masterplan includes residential housing in the area of the former airport, including runway areas that may have been mined. Preliminary geophysical surveys have indicated the presence of features that may represent UXO, including pipe mines. Additional work will probably need to be undertaken to mitigate the risk from UXO in this area. This will likely need to include non-intrusive surface surveys (electromagnetic and radar) covering any areas of proposed ground disturbance and the attendance of Explosive Ordnance Clearance (EOC) engineers during any excavation works. Where deeper excavations (>2m) for foundations etc. are required, deeper clearance methods may be required.

13.1.5 Otterpool Quarry SSSI

The former Otterpool Quarry in the centre of the site is a protected SSSI. This imposes limits of the development allowed in this area. Potential options for management and improvement of the site have been discussed with Natural England. If changes are made to the site management these need to be approved by Natural England and must not adversely impact the features of interest.

13.2 Recommendations

1. Additional ground investigation and risk assessment in accordance with BS 10175 and CLR11 [20] will be required for each phase of development, with the expectation being to confirm the generally low risks to the receptors identified in this report, and define location specific mitigation measures. This should include:
    - Testing of soil and groundwater samples and quantitative risk assessment for human health and controlled waters. with regards to the proposed form and layout of development (e.g. human exposure scenarios and proposed foundation design). This should include further testing of groundwater and surface waters for dissolved metals.
    - Additional ground gas monitoring within the identified potential gas sources (e.g. on-site landfill) to confirm that the risk from ground gases to human and built receptors is low. The number and frequency of gas monitoring rounds is dependent on the form of development. Away from the potential gas sources further monitoring may not be required, the Local Authority should be contacted to determine their requirements.
    - Particular focus should be given to the Lympne Industrial Park landfill to confirm the ground conditions and fill thickness within the landfill especially if this is to be developed.
2. Additional ground investigation to support the design of foundations and other structures will be required, and should include specific determination of load settlement response in Alluvial and Head Deposits in particular.

3. Preparation of a Materials Management Plan (MMP) in accordance with the CL:AIRE Industry Code of Practice [37] for each phase of development is recommended to maximise sustainable reuse of topsoil and subsoil within the development.
4. A risk mitigation plan should be prepared by a UXO specialist for any development within the areas given a medium or high UXO hazard rating. The plan should identify the recommended risk mitigation techniques appropriate for the proposed form of development, and EOD procedures in the event of encountering UXO.
5. Additional ground investigation to determine the geological sequence in the SSSI site and map the interest features in greater detail is recommended. This would inform the potential options for protecting and incorporating the geological SSSI site into the development.

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DRAWINGS

Arcadis	**0001-UA008926-UP32D-01**	**Site Location Plan**
Farrells	**OPM(P)1016K 17-12-18**	**Indicative Masterplan Phases Rev.K**
Arcadis	**0002-UA008926-UP32D-01**	**Bedrock and Superficial Geology**
Arcadis	**5002-UA008926-UP31-S2-02**	**Potentially Contaminative Land Uses**
Arcadis	**0003-UA008926-UP32D-01**	**Exploratory Hole Locations and Proposed Masterplan**
Arcadis	**0004-UA008926-UP32D-01**	**Exploratory Hole Locations and Geology**
Arcadis	**0005-UA008926-UP32D-01**	**Pollution Incidents**

Legend

🟥 2018 Site Boundary

▲ Site Centre Point

OS X (Eastings)	611240
OS Y (Northings)	136720
Nearest Post Code	TN25 6DA
Lat (WGS84)	N51:05:27 (51.090876)
Long (WGS84)	E1:00:54 (1.015137)
Lat,Long	51.090876,1.015137
Nat Grid	TR112367 / TR1124036720
mX	113004
mY	6604114
Mapcode	GBR SYZ.KH3

revision	date	status	author	checker	approver
01	26/10/2018	FINAL	JR	AP	GF

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OTTERPOOL PARK

0001-UA008926-UP32D
Site Location Plan

scale	original size	datum	grid
1:150,000	A3	mAOD	OSGB 27700

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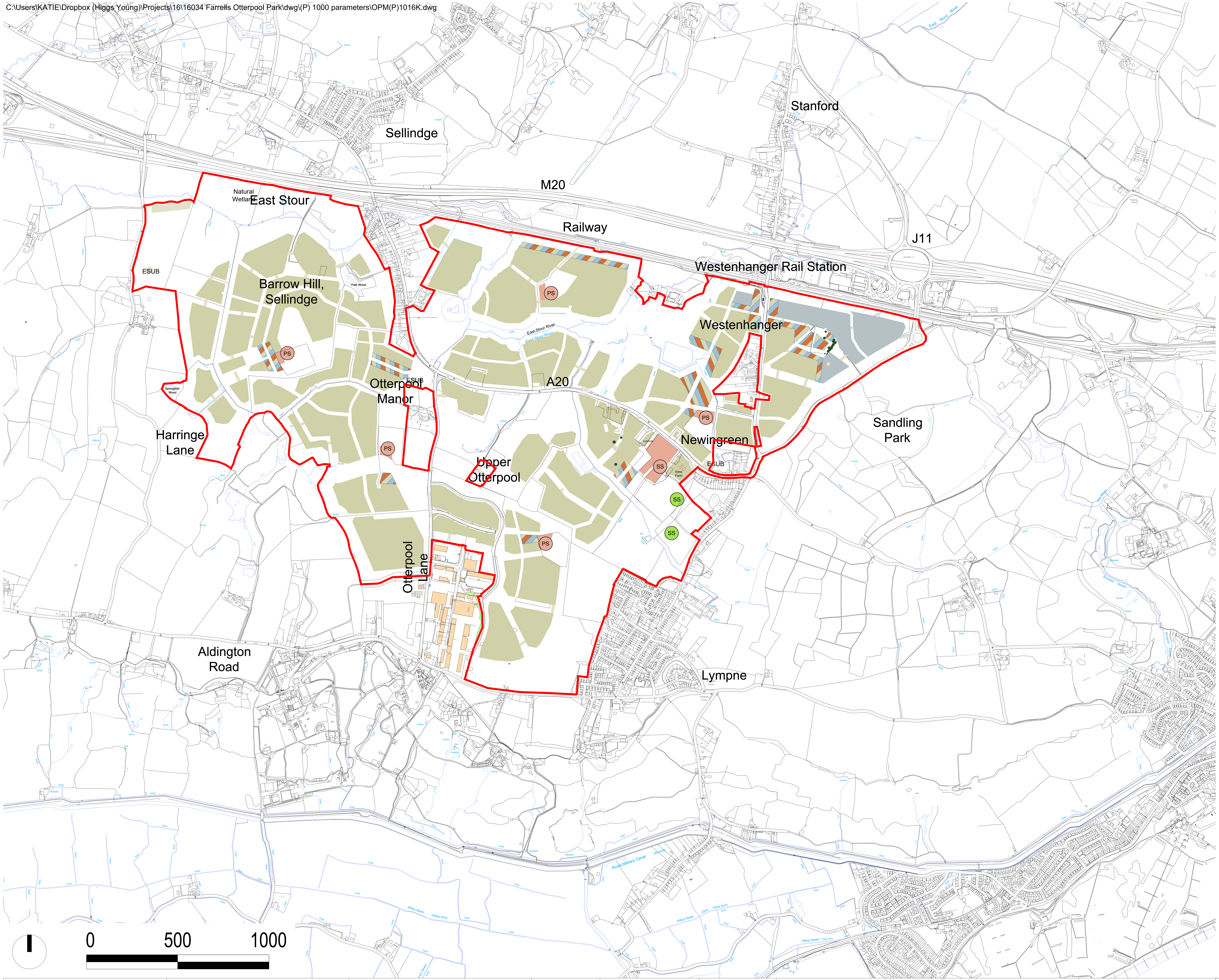


Existing Uses

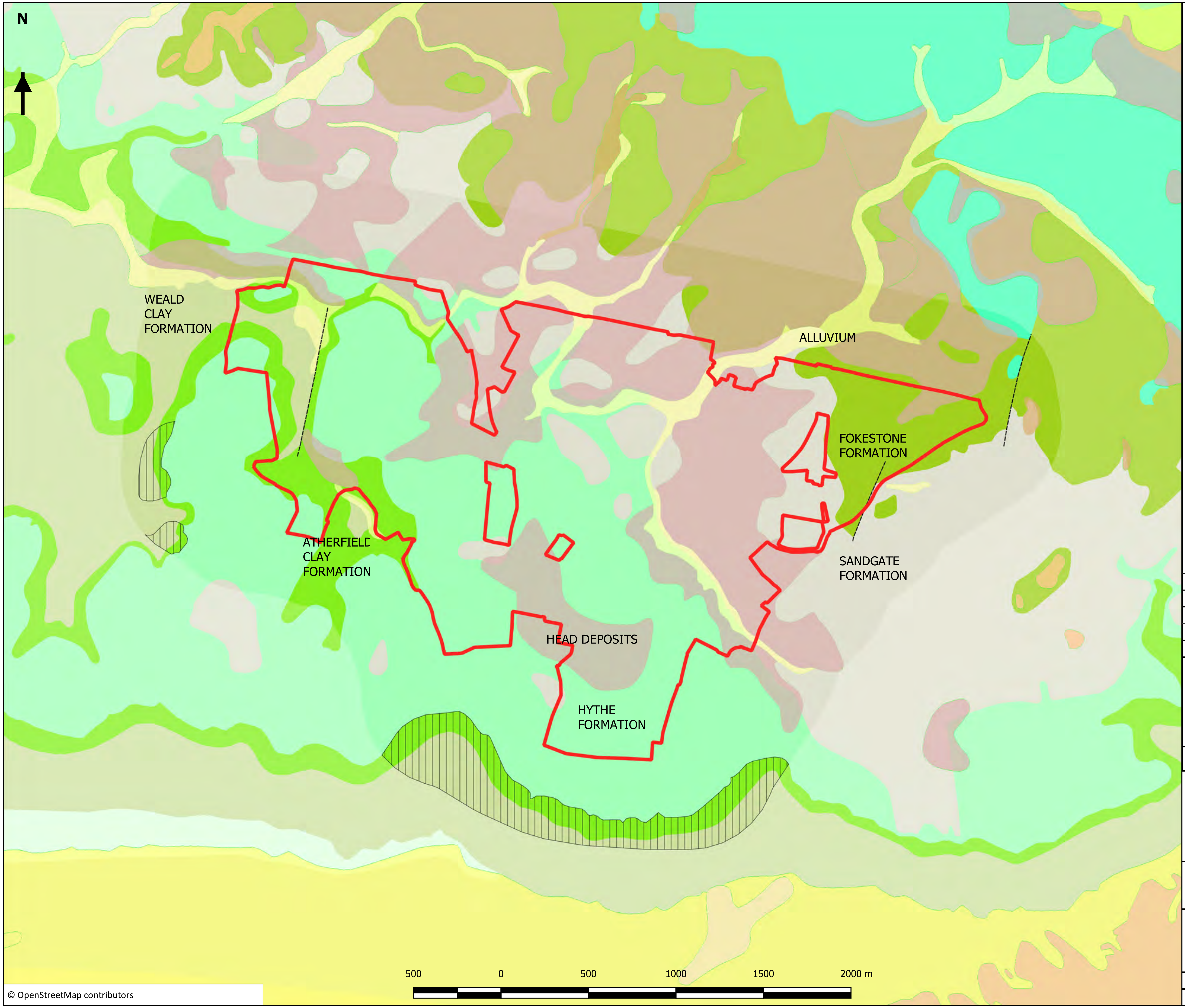
Indicative Uses

- 🟩 Indicative Residential Development
- ▨ Indicative Business development area
- ▭ Indicative Road Connections
- SS SS Indicative Secondary School & Sports
- PS Indicative Primary School
- ▨ Mixed use Local Centres

- ▬ Application Red Line

	CLIENT	REVISIONS	DATE	STATUS	SCALE	PROJECT	DRAWING NAME	DRAWING NUMBER	
	...	First : 15-05-18 rev A: 04-06-18 rev B: 25-07-18 rev C: 10-08-18 rev D: 15-08-18 rev E: 06-09-18 rev F: 16-10-18 rev G: 23-10-18 rev H: 30-11-18 rev J: 07-12-18 rev K: 17-12-18	15-05-18	FOR APPROVAL	1:10,000 @ A1	OTTERPOOL PARK	DEVELOPMENT AREAS	OPM(P)1016K	**FARRELLS**

ALL DIMENSIONS, LEVELS, COORDINATES, SETTING OUT, TO BE CHECKED ON SITE AND ANY DISCREPANCY REPORTED IMMEDIATELY TO THE ARCHTECT AND PROJECT MANAGER.



© OpenStreetMap contributors

Legend

▥ Mass movement (Landslide Deposits)

Superficial Deposits

- ■ Alluvium
- ■ Head Deposits - Clay and Silt
- ■ Head Deposits - Clay, Silt, Sand and Gravel
- ■ Peat

Bedrock Geology

- ■ Atherfield Clay Formation
- ■ Folkestone Formation
- ■ Gault Clay Formation
- ■ Hythe Formation
- ■ Sandgate Formation
- ■ Weald Clay Formation
- ---- Faults (inferred)

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0002-UA008926-UP32D
Bedrock and Superficial Geology

scale	original size	datum	grid
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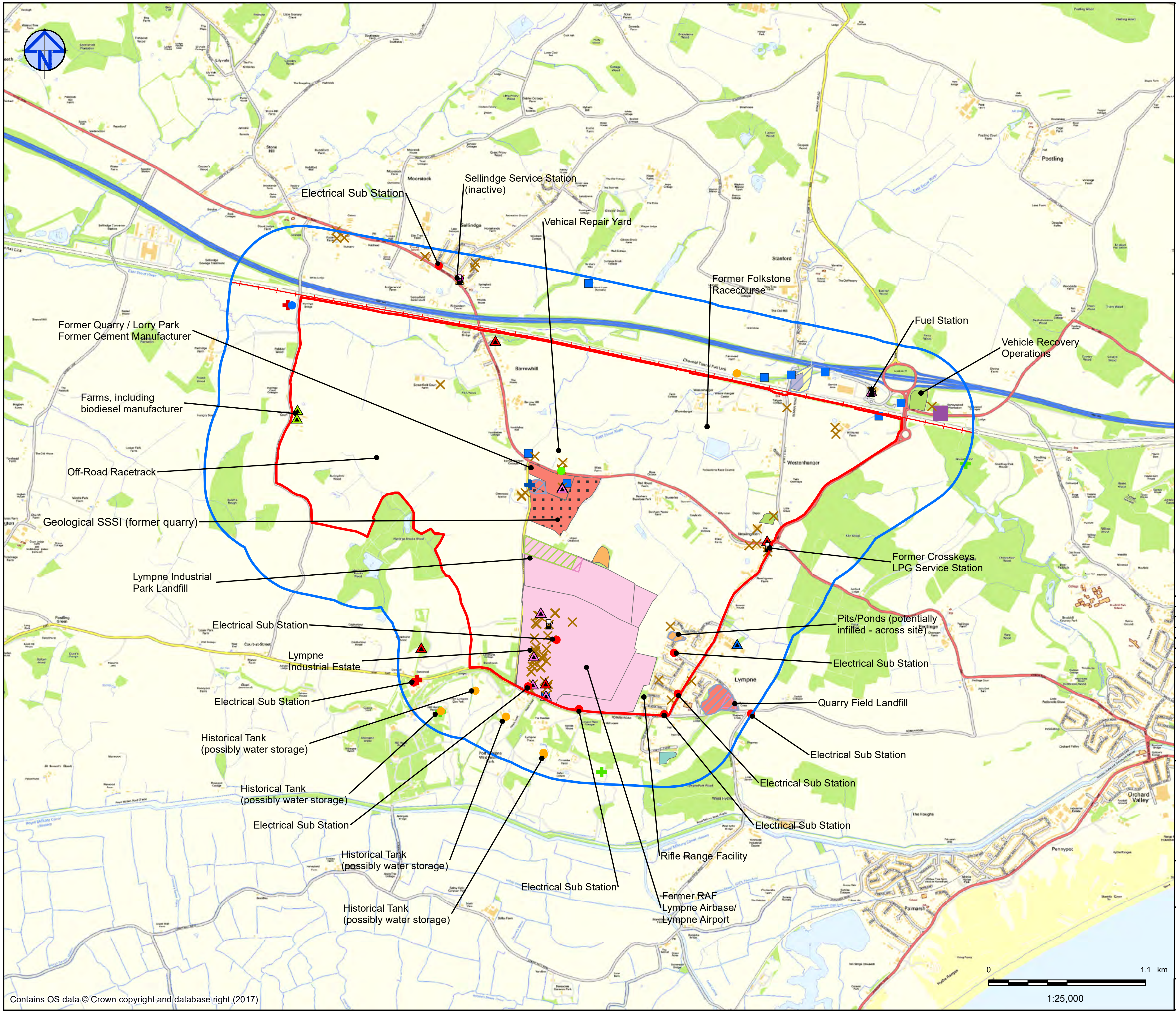

Legend

▭	Site Boundary
▭	500m Buffer
⛽	Fuel Stations
●	Electrical Sub Station
●	Electricity Industry Facilities
●	Petroleum Storage Facilities
●	Potential Tanks
●	Tanks
▲	Integrated Pollution Prevention and Control
▲	Local Air Pollution Prevention and Control
▲	Pollution Incident Register
▲	Pollution Incident Controlled Water
✕	Contemporary Trade Directory Entries
■	Discharge Consents
✚	Electricity production & distribution [inc large transformers]
✚	General quarrying
✚	Sewage
■	Potentially Infilled Land
+	Contaminated Land (Railway)
▨	Potentially Infilled Land
▨	Registered Landfill
▨	Historic Landfill
■	Cemetery or Graveyard
■	Clay bricks & tiles [manufacture]
■	Factory or works - use not specified
■	General quarrying
■	Quarrying of sand & clay, operation of sand & gravel pits
■	Road haulage
■	Transport: air and space, cargo and handling and transport support

Note:
1. Potentially contaminated land uses have been identified on desk-based information utilising Landmark Envirocheck
2. Data from GIS system is available data therefore not to be used for detailed design and construction

REV	Date	Description	Drawn	Check	Approv
2	31/07/2017	Revision 2	DS	SC	AP
1	17/07/2017	Revision 1	NAR	SC	AP

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Figure 10.1
Land Quality - Potentially Contaminative Land Uses

scale	original size	datum	grid
1:25,000	A3	NEWLYN	OS

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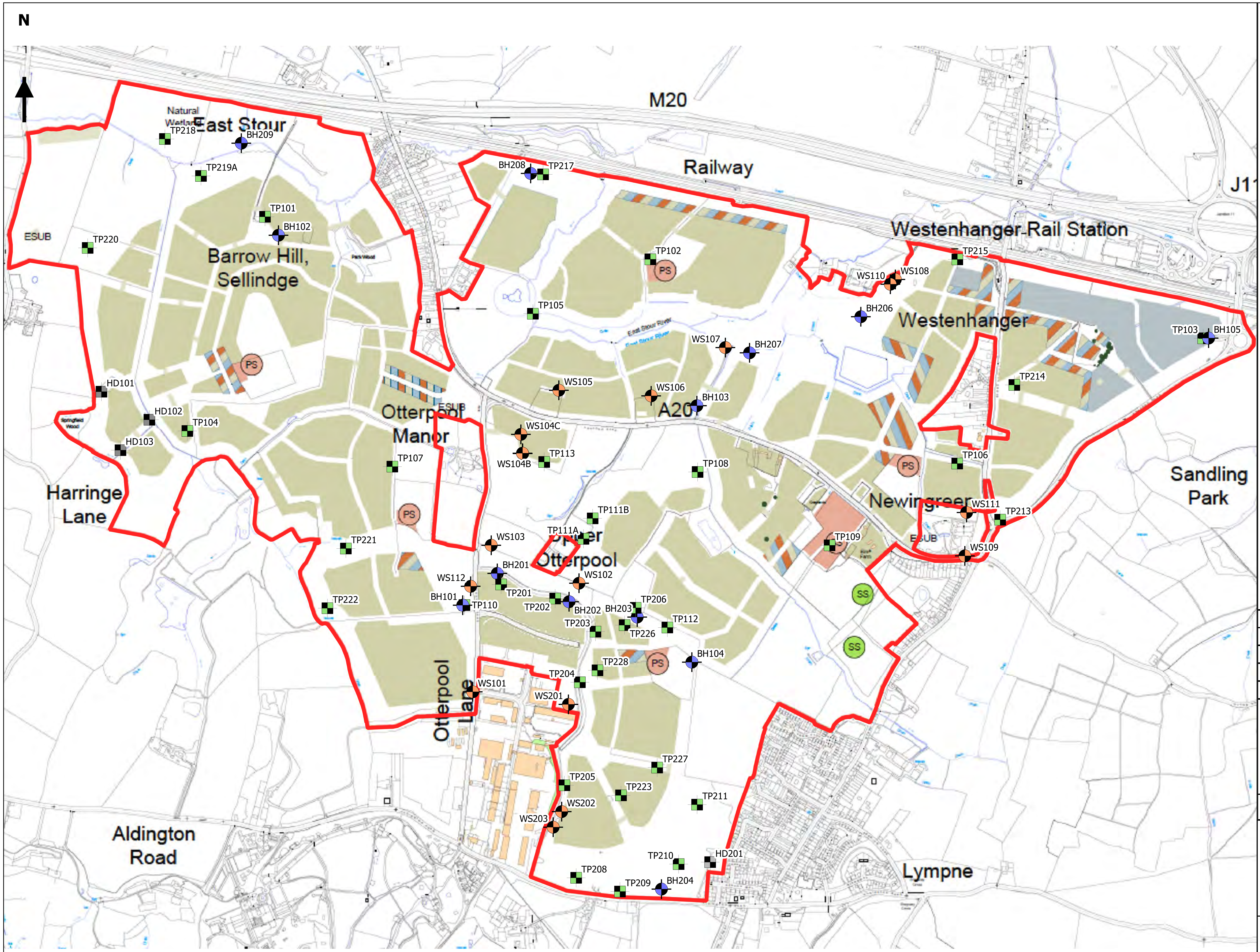

Legend

- ⊕ Arcadis Boreholes
- ▪ Arcadis Hand Dug Pits
- ▪ Arcadis Trial Pits
- ⊕ Arcadis Window Samples

Indicative Uses

- 🟩 Indicative Residential Development
- ▨ Indicative Business development area
- ▭ Indicative Road Connections
- SS SS Indicative Secondary School & Sports
- PS Indicative Primary School
- ▨ Mixed use Local Centres

Indicative Masterplan Uses taken from Farrells Drawing Ref. OPM(P)1016K dated 17-12-18.

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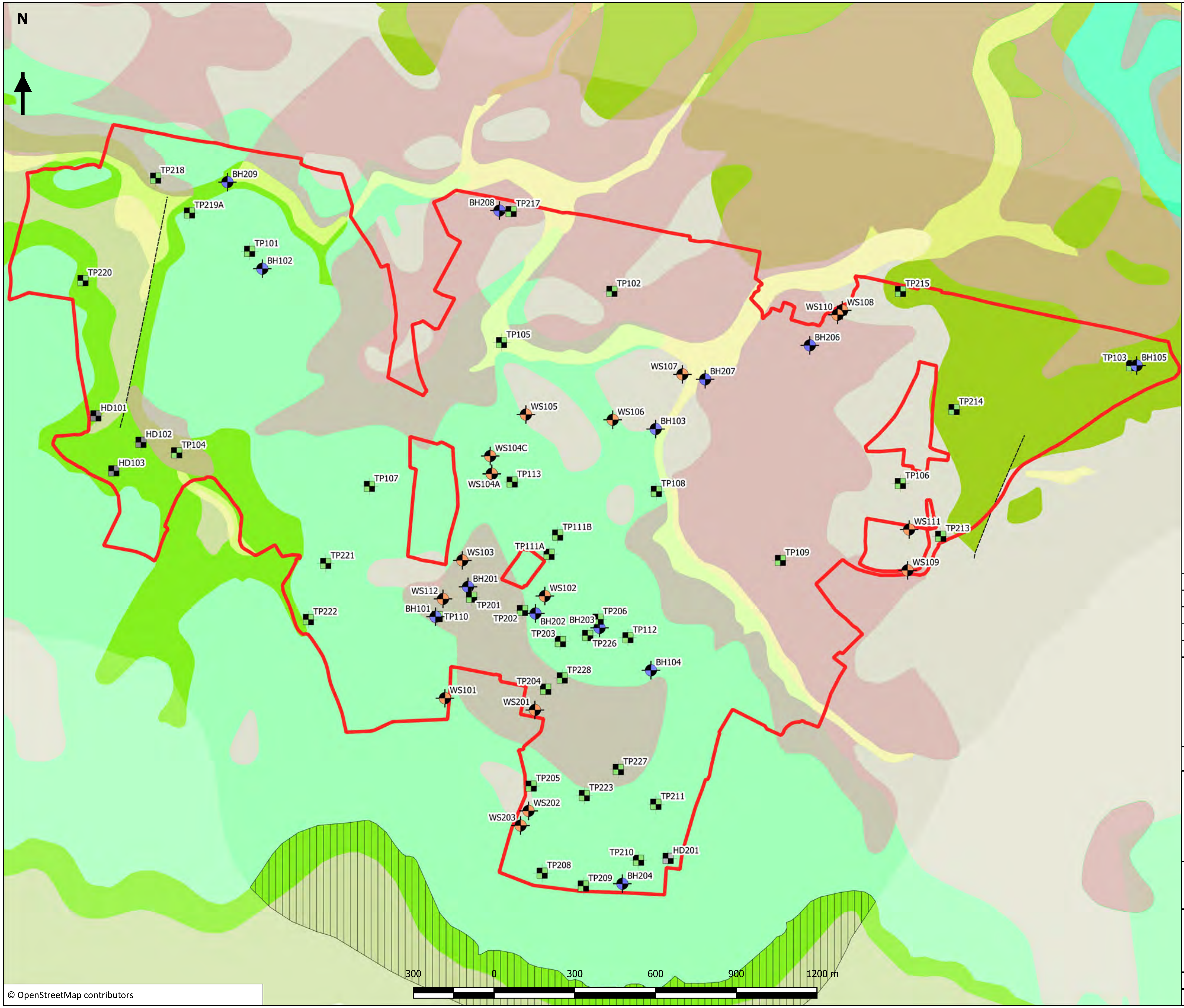
Exploratory Hole Locations and Proposed Masterplan

250 0 250 500 750 1000 m

scale	original size	datum	grid
1:13,000	A3	mAOD	OSGB 27700



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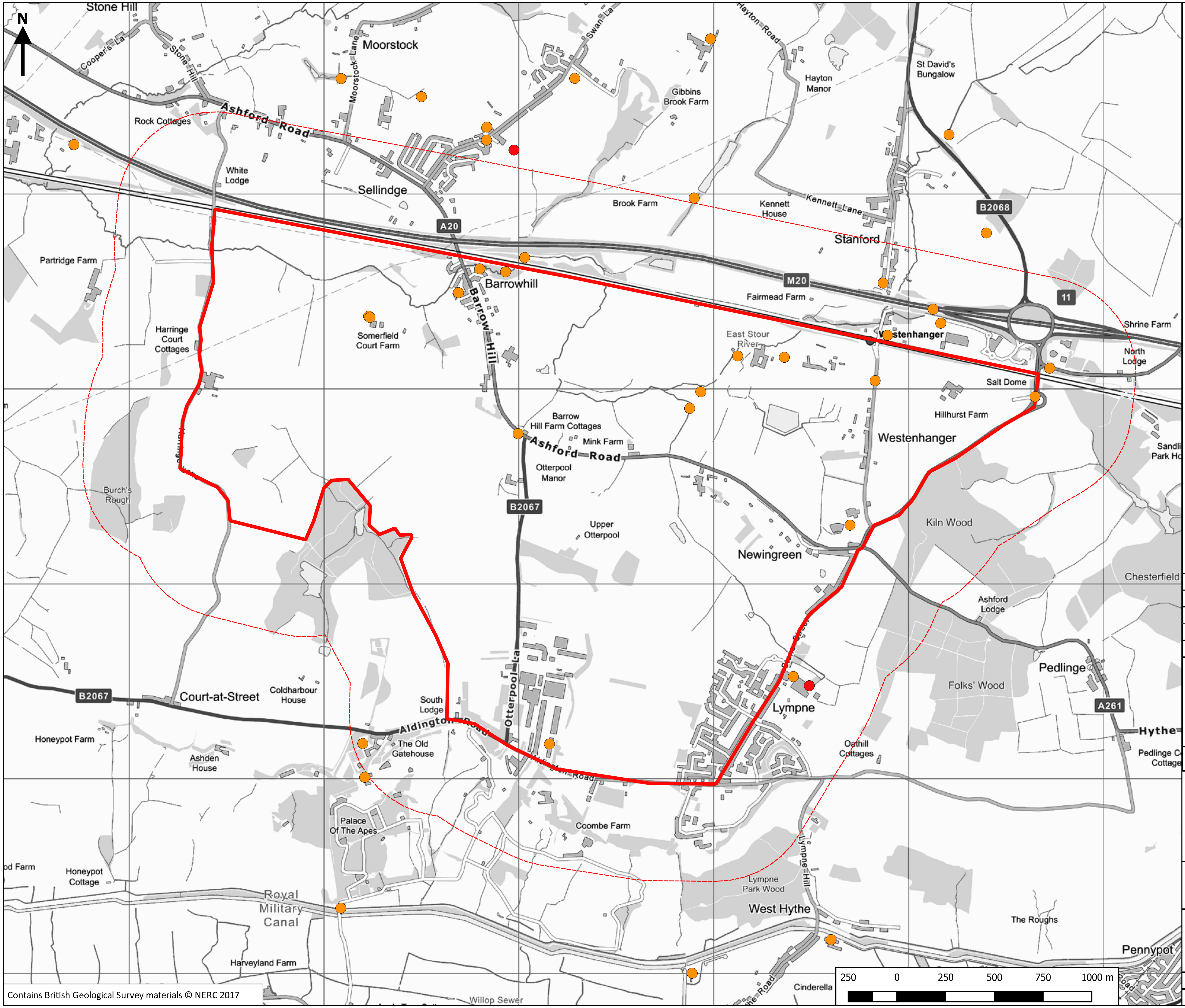
Exploratory Hole Locations and Geology

scale	original size	datum	grid
1:13,000	A3	mAOD	OSGB 27700



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Legend

🟥 Site Boundary

⬚ Site Boundary 500m Buffer

Recorded Pollution Incidents [38]

● Category 2 (Significant) [2]

● Category 3 (Minor) [36]

Notes:
Pollution Incidents shown which are classified as having Category 3 (Minor) or higher impact to land or water.

revision	date	status	author	checker	approver
01	21/10/2017	DRAFT	JR	AP	GF

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Recorded Pollution Incidents

scale	original size	datum	grid
1:18,000	A3	mAOD	OSGB 27700

APPENDIX A

Arcadis Ground Investigation Factual Report, December 2017

OTTERPOOL PARK

Ground Investigation Factual Report

December 2017

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Otterpool Park

Ground Investigation Factual Report

AUTHORISED SIGNATURES

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Checker	Ian Parsons
Approver	Jon Venn
Report No	UA008926-43--AFS-GLR-G001
Date	December 2017

Version control

Version	Date	Author	Changes
00	December 2017	Sam Summers	

This report dated December 2017 has been prepared for Shepway District Council (the "Client") in accordance with the terms and conditions of appointment dated 3rd July 2017 (the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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APPENDIX D

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GEOTECHNICAL LABORATORY TEST DATA

APPENDIX G

GEO-ENVIRONMENTAL LABORATORY TEST DATA

1 INTRODUCTION

Shepway District Council propose to develop a new garden town known as Otterpool Park in the county of Kent, to the south east of Ashford. This ground investigation was commissioned by Shepway District Council, 'the Client', to inform on the ground conditions at the site.

The scope of the ground investigation was determined by Arcadis Consulting (UK) Ltd, and the work was instructed on the 3rd July 2017.

This report provides a factual account of the fieldwork undertaken including engineering descriptions of the various strata encountered, results of *in situ* testing and the subsequent geotechnical and geo-environmental laboratory testing undertaken on samples obtained.

1.1 Limitations

This report has been prepared for the Client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document, including the electronic format and any AGS data, shall remain the property of Arcadis.

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It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, seasonal, climatic variations and those recorded in this report are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

1.2 Proposed Development

The proposed development comprises a new garden town which will comprise housing, land for employment, shops, schools and medical centres, as well as extensive open spaces and access to the countryside.

1.3 Existing Information

1. Otterpool Park Garden Town, Site Investigation Plan; Arcadis 2017
2. Otterpool Fusion Plan, Service drawings; Centara, 2017
3. Otterpool Park, UXO Desk study and risk assessment; Zetica 2017

2 SITE DETAILS

2.1 Site Location and Description

The site is situated approximately 6 km southeast of Ashford, Kent at approximate grid reference TR 10982 36516. Figure 2-1 shows the site location.

The site boundary

Contains OS data © Crown copyright (2017)

Figure 2-1 Site Location

At the time of the investigation, the site comprised arable and pasture fields, roads and trackways, farms and small clusters of buildings. The old Folkestone Racecourse forms the northeast part of the site. An industrial estate is located in the southern part of the site, and is surrounded by an earth embankment.

The A20 traverses the site in a roughly east to west orientation, and the B2067 traverses the site north to south. There are sporadic ditches and ponds across the site and a dirt-bike track located to the north west of the site.

The M20 and a railway line borders the site to the north, and the site is surrounded by agricultural land in all other directions. Small towns such as Westenhanger, Newingreen and Lympne are located to the east of the site.

Springfiled Wood and Park Wood are located within the site boundary. Rabbit Wood, Harringe Brook Woods and Folks Wood border the site to the west, southwest and east respectively.

The topography of the site slopes downwards towards the north, with an approximate ground elevation of 100 m AOD on the sites southern boundary (B2067) to 65 m AOD on the sites northern boundary (railway line). Barrowhill, which is located in the northwest part of the site, has a ground elevation of 80 m AOD.

With reference to the Environment Agency (EA) ‘What’s in my backyard?’ website [18], there are no active landfills located within 1 km of the site. Two historical landfills were identified to be within 1 km of the site, including one located on site. A summary of the historic landfills is shown in Table 2-1.

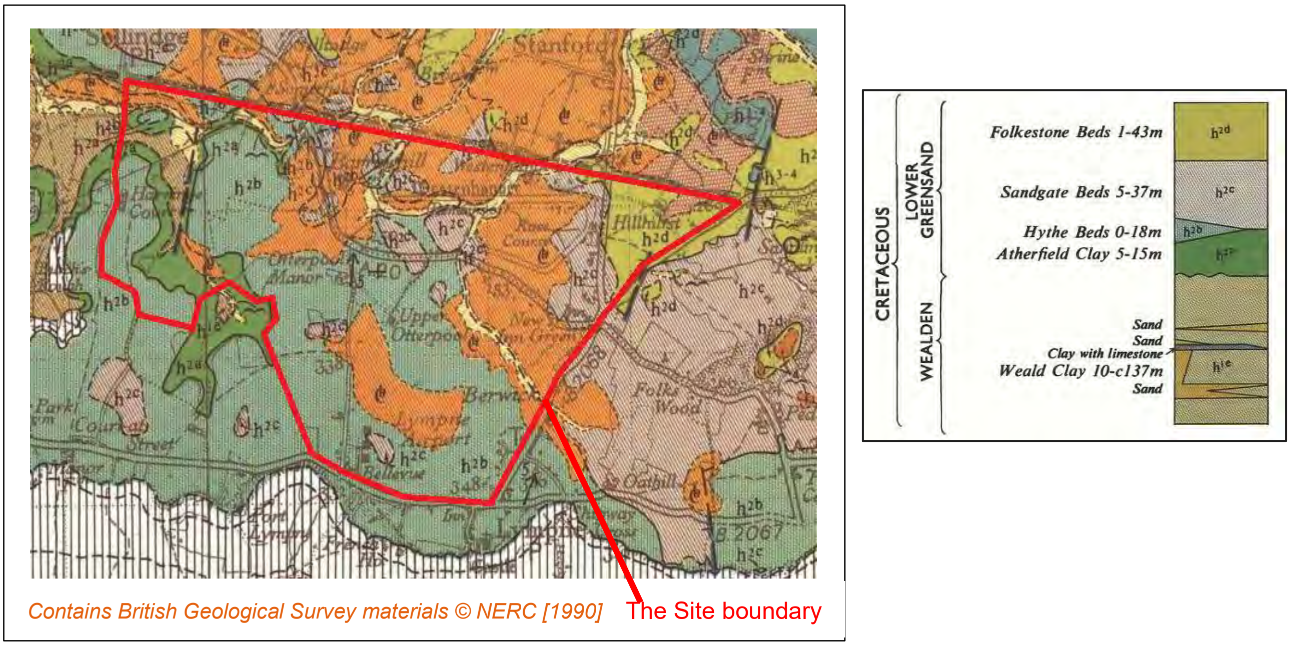
Table 2-1 Historical landfills

Landfill Name	Distance from Site	Date of Closure	Waste Description	Waste Control Measures
Lymnpe Industrial park	On-site	Not specified	Inert	Not specified
Quarry Field	430 m southwest	Dec 1962	Inert and Household	Not specified

2.2 Geology

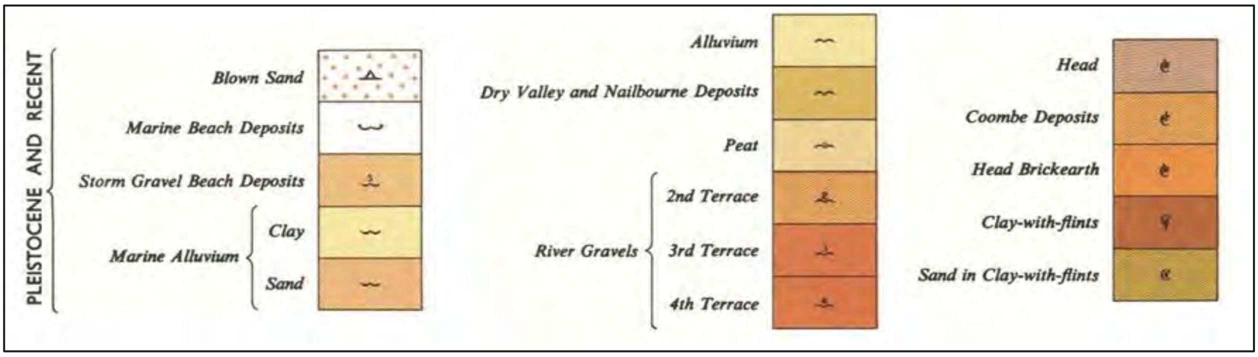
In summary, the published 1:50 000 scale British Geological Survey (BGS) map of the area incorporating the site, Sheet 305 & 306 [1], and the BGS online GeoIndex [17] indicate the site is underlain by superficial deposits of Head (clay and silt) and Alluvium (clay silt, sand and gravel).

The underlying bedrock geology consists of strata from the Folkstone Formation (sandstone), the Sandgate Formation (sandstone, siltstone and mudstone), the Hythe Formation (interbedded sandstone and limestone), the Atherfield Clay Formation (sandy mudstone) and the Weald Clay Formation (mudstone).



Contains British Geological Survey materials © NERC [1990]

Figure 2-2 Geological Setting



A summary of the anticipated geological sequence is shown in Table 2-2.

Table 2-2 Anticipated geological sequence

Period	Formation	Description
Quaternary	Alluvium	Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.
	Head	Polymict deposit: comprises gravel, sand and clay depending on upslope source and distance from source. Poorly sorted and poorly stratified deposits formed mostly by solifluction and/or hillwash and soil creep. Essentially comprises sand and gravel, locally with lenses of silt, clay or peat and organic material. In the Bristol area: red or brown silt and stony clay with cobbles of hard rock, eg Carboniferous limestone or sandstone. Argillaceous frost-shattered rock debris either *insitu* or solifluncted. Solifluncted deposits have variable sand/clay content.
Cretaceous	Folkstone Formation	In Sussex, Kent and Surrey the formation comprises medium- and coarse-grained, well-sorted cross-bedded sands and weakly cemented sandstones; elsewhere includes calcareous sandstones. There are no formal divisions in the Weald, but equivalent beds in the west are termed the Child Okeford Sand Member and the Bedchester Sands Member.
	Sandgate Formation	Fine sands, silts and silty clays, commonly glauconitic; some sands limonitic or calcareous; some soft sandstones.
	Hythe Formation	In the western Weald, the formation comprises mainly fine- to medium-grained, sparsely glauconitic sands, sandstones and silts, locally pebbly, with calcareous or siliceous cement in beds or lenses in some areas. Some clay interbeds, including Fuller's Earth. In Kent and eastern Sussex the formation comprises, alternating sandy limestones ("Ragstone") and glauconitic sandy mudstones (Hassock).
	Atherfield Clay Formation	Generally massive yellowish brown to pale grey sandy mudstone throughout most of its outcrop, with an impersistent phosphatic pebble bed with vertebrate bones, gritty sandstone or very shelly sandy mudstone with glauconite, at the base. At the type site on the Isle of Wight, the predominant lithology is blue grey mudstone, variably sandy with calcareous concretions; the formation includes beds of sandstone, clay ironstone and phosphatic nodules. Weathers to a chocolate brown, bluish grey and brown, mottled pinkish brown to orange.
	Weald Clay Formation	Dark grey thinly-bedded mudstones (shales) and mudstones with subordinate siltstones, fine- to medium-grained sandstones, including calcareous sandstone (e.g. Horsham Stone Member), shelly limestones (the so called "Paludina Limestones") and clay ironstones.

Two faults are located on site comprising a north to south trending fault located approximately 800 m east of the site's western boundary. The fault sub-crop is approximately 1 km long and the downthrow is to east. A second north to south trending fault is located on the eastern boundary of the site. The fault sub-crop is approximately 700 m long, and the downthrow is to the west.

In addition to the published data described above, a review of data from BGS online GeoIndex [17] identified four historical boreholes located on site. A summary of the encountered geological sequence in the historical borehole is shown in Table 2-3 and also shown in Appendix C.

Table 2-3 Encountered geological sequence in historical borehole logs

Borehole	Depth (m)	Description
TR13NW83	0.00 – 5.31	Folkstone Beds
TR13NW84	0.00 – 7.39	Hythe Beds
TR13NW31	0.00 – 6.10	Sandgate Beds
	6.10 – 18.00	Hythe Beds
TR13NW44	0.00 – 0.25	Top Soil
	0.25 – 2.15	Medium dense to dense, grey brown, locally glauconitic clayey silty SAND, with occasional flint fragments [HEAD]
	2.15 – 2.70	Medium strong, grey sandstone to borderstone overlying hard RASSTONE beds [HYTHE BEDS]

The Coal Authority website [**Error! Reference source not found.**] indicates no evidence of coal outcrops or mining activities within the immediate vicinity of the site.

2.3 Hydrogeology and Hydrology

The superficial deposits (Alluvium) are classified as a Secondary A aquifer, meaning "*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*".

The superficial deposits (Head) located in the northeast part of the site are classified as a Secondary Undifferentiated aquifer, meaning "this *has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type*".

The bedrock deposits (Folkstone Formation and Hythe Formation) are classified as Principal aquifers, meaning "*these are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale*".

The bedrock deposits (Sandgate Formation) are classified as a Secondary A aquifer.

The bedrock deposits (Atherfield Clay Formation and Weald Clay Formation) are classified as Unproductive Strata, meaning "*these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow*".

The site is not situated in a source protection zone.

The closest surface water feature is the East Stour River, which is located in the northern part of the site and is trending from east to west. A number of small streams and ponds feed into the East Stour River from across the site. A spring is located in the southeast part of the site.

A flood risk zone, level 2 and 3, is located in the northern part of the site. This is associated with East Stour River.

3 FIELDWORK

3.1 General

Ground investigation works were carried out in a single phase between the 14th and 25th of August 2017. Return land gas and groundwater monitoring was conducted over three weekly visits between the 1st and the 15th of September 2017.

The scope of the ground investigation, including the location, scheduled depth and type of exploratory hole undertaken was determined by Arcadis Consulting (UK) Ltd and is summarised in Table 3-1.

The ground investigation methods were undertaken in general accordance with the principles set out in BS EN 1997-2:2005 [7] and with the general practice described in BS5930:2015 [8]. The geo-environmental aspects of the ground investigation complied with the general requirements of BS 10175:2011 [9].

Table 3-1 Initial ground investigation scope

Location ID	Hole Type	Scheduled Depth (m)	Requirements
BH101	RC	10.0	Determine thickness of engineering soils and rock; identify groundwater level; collect representative samples of strata and undertake *in situ* tests
BH101A	OH	10.0	Undertake variable head testing above groundwater level identified in adjacent RC hole
BH102	RC	10.0	Determine thickness of engineering soils and rock; identify groundwater level; collect representative samples of strata and undertake *in situ* tests
BH103	RC	10.0	
BH103A	OH	10.0	Undertake variable head testing above groundwater level identified in adjacent RC hole
BH104	RC	10.0	Determine thickness of engineering soils and rock; identify groundwater level; collect representative samples of strata and undertake *in situ* tests
BH104A	OH	10.0	Undertake variable head testing above groundwater level identified in adjacent RC hole
BH105	RC	10.0	Determine thickness of engineering soils and rock; identify groundwater level; collect representative samples of strata and undertake *in situ* tests
WS101	DS	5.0	Determine thickness of engineering soils; collect representative samples of strata and undertake *in situ* tests
WS102	DS	5.0	
WS103	DS	5.0	
WS104	DS	5.0	
WS105	DS	5.0	

Location ID	Hole Type	Scheduled Depth (m)	Requirements
WS106	DS	5.0	Determine thickness of engineering soils; collect representative samples of strata and undertake *in situ* tests
WS107	DS	5.0	
WS108	DS	5.0	
WS109	DS	5.0	
WS110	DS	5.0	
WS111	DS	5.0	
WS112	DS	5.0	
TP101	TP	2.50	Determine thickness of engineering soils; undertake large scale soakaway testing; collect representative samples of strata and undertake *in situ* tests
TP102	TP	2.50	
TP103	TP	2.50	
TP104	TP	2.50	
TP105	TP	2.50	Determine thickness of engineering soils; collect representative samples of strata and undertake *in situ* tests
TP106	TP	2.50	Determine thickness of engineering soils; undertake large scale soakaway testing; collect representative samples of strata and undertake *in situ* tests
TP107	TP	2.50	
TP108	TP	2.50	
TP109	TP	2.50	
TP110	TP	2.50	
TP111	TP	2.50	Determine thickness of engineering soils; collect representative samples of strata and undertake *in situ* tests
TP112	TP	2.50	Determine thickness of engineering soils; undertake large scale soakaway testing; collect representative samples of strata and undertake *in situ* tests
TP113	TP	2.50	Determine thickness of engineering soils; collect representative samples of strata and undertake *in situ* tests
HD101	HTP	1.20	Determine thickness of engineering soils; collect representative samples of strata and undertake *in situ* tests
HD102	HTP	1.20	
HD103	HTP	1.20	

Notes
TP = trial pitting, HTP = hand excavated trial pit, DS = dynamic sampling, RC = rotary core drilling, OH = open hole drilling

The investigation works were carried out under the supervision of a suitably experienced ground engineer who undertook the logging and reporting of the exploratory holes and *in situ* testing.

3.2 Exploratory Holes

3.2.1 Exploratory Hole Locations

The co-ordinates and elevations of the exploratory hole locations were obtained by the Arcadis supervising engineer using a Trimble VRS NOW GPRS system; with an accuracy of +/-50 mm.

Drawing UA008926-43-GLR-DWG-0001 presented in Appendix A displays the locations of the as-constructed exploratory holes while the co-ordinates and elevation of the ground surface at each exploratory hole are given on the individual logs. The full logs can be seen in Appendix C.

3.2.2 Investigation Methodology

The following methods and techniques were undertaken to construct the exploratory holes. The completed scope of investigation is summarised in Table 3-2 below.

Details of the methods of investigation and associated standards adopted are presented in Appendix B; the exploratory hole records are presented in Appendix C, a key to the notation and symbols used on the logs is presented in Appendix B.

Table 3-2 Summary of completed exploratory holes

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Comment	Termination Reason
BH101	RC	23/08/2017	23/08/2017	10.00	Groundwater not encountered. Installation details: Raised cover with gas bung, GL - 6.00m plain pipe, 6.00 - 10.00m slotted pipe. Backfill details: GL - 0.10m concrete, 0.10 - 5.50m bentonite, 5.50 - 10.00m gravel.	Scheduled depth
BH101A	OH	-	-	-	Abandoned due to groundwater not being encountered in BH101.	n/a
BH102	RC	24/08/2017	24/08/2017	10.00	Groundwater not encountered. Installation details: Flush cover with gas bung, GL - 7.00m plain pipe, 7.00 - 10.00m slotted pipe. Backfill details: GL - 0.10m concrete, 0.10 - 6.50m bentonite, 6.50 - 10.00m gravel.	Scheduled depth
BH103	RC	15/08/2017	17/08/2017	10.00	Groundwater encountered at 1.80m rising to 1.70m after 20 mins. Installation details:	Scheduled depth

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Comment	Termination Reason
					Raised cover with gas bung, GL - 4.00m plain pipe, 4.00 - 10.00m slotted pipe. Backfill details: GL - 0.10m concrete, 0.10 - 3.50m bentonite, 3.50 - 10.00m gravel	
BH103A	OH	-	-	-	Abandoned due to shallow groundwater being encountered in BH103.	n/a
BH104	RC	21/08/2017	21/08/2017	9.95	Groundwater encountered at 4.00m, rising to 3.80m after 20 mins. Installation details: Raised cover with gas bung, GL - 2.00m plain pipe, 2.00 - 9.95m slotted pipe. Backfill details: GL - 0.10m concrete, 0.10 - 1.50m bentonite, 1.50 - 9.95m gravel	Scheduled depth
BH104A	OH	-	-	-	Abandoned due to shallow groundwater being encountered in BH104.	n/a
BH105	RC	22/08/2017	22/08/2017	10.00	Groundwater encountered at 4.20m, rising to 4.00m after 20 mins. Installation details: Flush cover with gas bung, GL - 2.00m plain pipe, 2.00 - 10.00m slotted pipe. Backfill details: GL - 0.10m concrete, 0.10 - 1.50m bentonite, 1.50 - 10.00m gravel	Scheduled depth
WS101	WS	16/08/2017	16/08/2017	3.00	Groundwater not encountered.	Refusal – soils too dense to penetrate
WS102A	WS	17/08/2017	17/08/2017	0.3	Groundwater not encountered.	Rockhead
WS102B	WS	17/08/2017	17/08/2017	0.20	Groundwater not encountered.	Rockhead

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Comment	Termination Reason
WS103	WS	15/08/2017	15/08/2017	5.00	Groundwater seepage encountered at 2.50m.	Scheduled Depth
WS104A	WS	17/08/2017	17/08/2017	0.30	Groundwater encountered at 0.30m, rising to 0.20m after 20 mins.	Refusal – soils too dense to penetrate
WS104B	WS	17/08/2017	17/08/2017	0.15	Groundwater encountered at 0.15m, rising to 0.10m after 20 mins.	Refusal – soils too dense to penetrate
WS104C	WS	17/08/2017	17/08/2017	4.00	Groundwater seepage encountered at 3.90m.	Refusal – soils too dense to penetrate
WS105	WS	14/08/2017	14/08/2017	2.85	Groundwater seepage encountered at 2.40m.	Refusal – soils too stiff to penetrate
WS106	WS	14/08/2017	14/08/2017	3.00	Groundwater seepage encountered at 1.90m.	Rockhead
WS107	WS	15/08/2017	15/08/2017	3.00	Groundwater encountered at 2.80m, rising to 2.00m after 20 mins.	Refusal – soils too dense to penetrate
WS108	WS	15/08/2017	15/08/2017	2.80	Groundwater seepage encountered at 2.40m.	Refusal – soils too stiff to penetrate
WS109	WS	16/08/2017	16/08/2017	3.00	Groundwater seepage encountered at 1.80m. Hole collapsed from 3.00m to 2.00m due to water strike.	Refusal – hole collapse
WS110	WS	16/08/2017	16/08/2017	3.00	Groundwater not encountered.	Refusal – soils too dense to penetrate
WS111	WS	17/08/2017	17/08/2017	0.60	Groundwater not encountered.	Refusal – soils too dense to penetrate
WS112	WS	16/08/2017	16/08/2017	3.50	Groundwater seepage encountered at 2.90m.	Refusal – soils too dense to penetrate

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Comment	Termination Reason
TP101	TP	15/08/2017	15/08/2017	2.00	Large scale soakaway conducted.	Rockhead
TP102	TP	14/08/2017	14/08/2017	2.50	Large scale soakaway conducted.	Scheduled depth
TP103	TP	18/07/2017	18/07/2017	2.50	Large scale soakaway conducted.	Scheduled depth
TP104	TP	16/07/2017	16/07/2017	2.80	Large scale soakaway conducted.	Scheduled depth
TP105	TP	21/08/2017	21/08/2017	2.50	Large scale soakaway abandoned due to stability issues.	Scheduled depth
TP106	TP	22/08/2017	22/08/2017	2.50	Large scale soakaway conducted.	Scheduled depth
TP107	TP	15/08/2017	15/08/2017	2.70	Large scale soakaway conducted.	Scheduled depth
TP108	TP	17/08/2017	17/08/2017	2.00	Large scale soakaway conducted.	Rockhead
TP109	TP	21/08/2017	21/08/2017	2.30	Large scale soakaway conducted.	Scheduled depth
TP110	TP	22/08/2017	22/08/2017	2.50	Large scale soakaway conducted.	Scheduled depth
TP111	TP	15/08/2017	15/08/2017	2.10	Large scale soakaway abandoned due to land owner issue.	Rockhead
TP111A	TP	22/08/2017	22/08/2017	0.40	Large scale soakaway abandoned due to shallow refusal.	Rockhead
TP112	TP	16/08/2017	16/08/2017	1.60	Large scale soakaway conducted.	Rockhead
TP113	TP	17/08/2017	17/08/2017	3.10	Large scale soakaway abandoned due to made ground.	Obstruction
HD101	HTP	21/08/2017	21/08/2017	1.20	No visual or olfactory evidence of contamination.	Scheduled depth
HD102	HTP	21/08/2017	21/08/2017	1.20	No visual or olfactory evidence of contamination.	Scheduled depth
HD103	HTP	21/08/2017	21/08/2017	1.20	No visual or olfactory evidence of contamination.	Scheduled depth

Notes
TP = trial pitting, HTP = hand excavated trial pit, DS = dynamic sampling, RC = rotary core drilling

3.2.3 Dynamic Sampling

Dynamic sampling was completed using a track-mounted sampling rig capable of driving windowless sampling tubes using a hydraulic hammer drive head to advance window sample tubes into the ground.

The time to drive the sampling tubes was recorded together with a description of the recovered materials by the supervising engineer or the lead driller.

Photographs of the materials recovered are presented with the appropriate hole log. To enable a representative photographic record, the samples were split prior to the photograph and subsequently destructively logged.

Due to the method of investigation, the materials recovered within the sampler apparatus were generally disturbed and were assessed as complying with Class 3 to Class 5 of BS EN 22475-2. Sub-samples of the material recovered in the liners were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at depths deemed appropriate by the supervising engineer.

Standard penetration tests (SPT) were undertaken using the track mounted rig at 1.0 m centres, and 1.5 m centres below 5.0m until the termination depth of the hole. Cone penetration tests (CPT) were undertaken where SPTs were deemed inappropriate.

3.2.4 Rotary Drilling

Rotary core drilling was undertaken using a track mounted multi-utility drilling rig. The drilling used standard PWF double-tube core barrels with a T6-116 type of bit and casing to produce core of 116 mm diameter. The boreholes were advanced using a compressed air flush.

Where the specified core recovery was not achieved, the length of core run was reduced on subsequent core runs until recovery improved.

Recovered cores were retained in appropriately sized semi-rigid plastic liner and placed in wooden core boxes for transport and logging. Photographs of each core box showing the recovered cores are presented with the appropriate rotary borehole log.

Sub-samples of core were removed from the core runs at intervals specified by Arcadis Consulting (UK) Ltd for subsequent laboratory testing, the location of the sub samples was indicated by placing wood sections to represent the core removed.

3.2.5 Trial Pitting/Trial Trenches

Trial pits (TP) were undertaken using a mechanical excavator. Hand excavated pits (HTP) were conducted with hand tools.

For the machine excavated pits, a JCB 3CX backhoe wheeled excavator was used and pits were entirely logged from the surface and arisings.

Samples of the material recovered in the trial pits were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was assessed as significant.

Photographic records of the trial pit elevation and arisings were taken and are presented with the associated trial pit log.

3.3 *In situ* Testing

3.3.1 Penetration Testing

3.3.1.1 Standard Penetration Tests

Standard penetration tests (SPT) were carried out as required in the investigation scope and in accordance with the methods given in the standard procedures presented within Appendix B. Generally, tests were undertaken at regular intervals throughout the borehole to provide a profile of the soil's resistance with depth and a disturbed soil samples was recovered from the SPT split-spoon tool or a disturbed sample was taken over the range of the test interval.

A summary of the SPT equipment used at each location is presented in Table 3-3.

Table 3-3 Test Hammer Calibrations

Location ID	SPT Hammer Reference No.	Energy Efficiency Ratio, E_r %	Comment
BH101-105	AR1704	68	
WS101-113	DT15183 17	55	

3.3.2 Hydraulic Tests

3.3.2.1 Water Permeability Tests in Open Systems

Permeability tests were carried out in those borehole installations listed in Table 3-4. The tests were carried out in general accordance with the requirements and methods given in BS EN ISO 22282-1:2012 [10] and BS EN ISO 22282-2:2012 [11]. Data sheets presenting the test information are presented with the corresponding exploratory hole record within Appendix C. The tests adopted either the Falling Head (FH) or Rising Head (RH) configuration as noted below.

Table 3-4 Summary of open system variable head permeability tests

Location ID	Test Type	Test Section top (m)	Test Section base (m)	Permeability k (ms^{-1})	Comment/limitations
BH101	FH	6.00	10.00	n/a	Test abandoned due to inability to produce head of water
BH103	FH	4.00	10.00	1.22×10^{-5}	Tests carried out in temporary standpipe
				4.57×10^{-6}	

				5.35 x 10^{-6}	
BH104	FH	2.00	9.95	1.01 x 10^{-6}	Tests carried out in temporary standpipe
				4.77 x 10^{-7}	
BH 105	FH	2.00	10.00	2.24 x 10^{-7}	Tests carried out in temporary standpipe
				1.28 x 10^{-7}	
WS112	FH	1.00	3.50	2.49 x 10^{-8}	Test carried out in temporary standpipe

3.3.2.2 Soakaway Tests

The soil infiltration rate was determined by conducting a soakaway tests in accordance with the methodology described in BRE 365 [4]. The tests were conducted in trial pits dug to the anticipated soakaway depth. Summary information of the tests is presented Table 3-5 while detailed test sheets are presented with the relevant trial pit log in Appendix C.

Table 3-5 Summary of trial pit soakage tests

Location ID	Depth of pit (m)	Time to empty (minutes)	Soil Infiltration Rate *f* (ms^{-1})	Comment/limitations
TP101	2.0	50	1.44 x 10^{-4}	Test pit filled only once due to time constraints
TP102	2.5	>240	n/a	Cannot be calculated due to lack of soakage
TP103	2.50	>120	n/a	Cannot be calculated due to lack of soakage
TP104	2.80	>240	n/a	Cannot be calculated due to lack of soakage

TP106	2.50	>240	n/a	Cannot be calculated due to lack of soakage
TP107	2.70	>240	n/a	Cannot be calculated due to lack of soakage
TP108	2.0	>240	8.69 x 10^{-6}	25% not attained, results are extrapolated
TP109	2.50	>240	n/a	Cannot be calculated due to lack of soakage
TP110	2.50	>240	4.15 x 10^{-6}	25% not attained, results are extrapolated
TP112	1.60	60	4.90 x 10^{-5}	Test pit filled only twice due to time constraints
	1.50	120	3.58 x 10^{-5}	

3.3.3 VOC Head Space Screening

The presence of Volatile Organic Compounds (VOC) within the ground was determined using a photoionization detector (PID) to detect the ‘headspace’ vapours emitted by the compounds. The method is applicable to a wide range of compounds that have sufficiently high volatility to be effected liberated from the soil or water matrix in normal temperature and pressure ranges.

The headspace test was undertaken on the freshly extracted soil core sample at regular intervals of 1.0 m by placing a small amount of material into a screw-top glass jar so that the jar was not more than half-full. The jar opening was covered with an aluminium foil sheet and the lid screwed on to form an air-tight seal. The sample and jar were then shaken for about 15 seconds to break-up and disperse the soil before resting the sample for about 5 minutes.

To assess the headspace vapour, the jar lid was removed and the PID inlet tube was inserted through the foil into the headspace area. The PID reading recorded was the highest response observed in the first 10 seconds. The screening results are presented on the relevant exploratory holes logs within Appendix C.

The testing was undertaken using a MiniRAE 2000 PID with a 10.6 eV lamp, which was calibrated regularly throughout the day.

3.4 Installations and Post-Fieldwork Monitoring

3.4.1 Installations

Installations to enable long term land gas and / or groundwater monitoring of the site were constructed in those boreholes selected by Arcadis Consulting (UK) Ltd and the details are summarised in Table 3-6 and are also provided on the relevant borehole logs.

Table 3-6 Summary exploratory hole installations

Location ID	Installation Type	Response Zone Top m bgl	Response Zone Base m bgl	Comment/limitations
BH101	SP50	6.00	10.00	Raised cover with gas bung, GL - 6.00m plain pipe, 6.00 - 10.00m slotted pipe.
BH102	SP50	7.00	10.00	Flush cover with gas bung, GL - 7.00m plain pipe, 7.00 - 10.00m slotted pipe.
BH103	SP50	4.00	10.00	Raised cover with gas bung, GL - 4.00m plain pipe, 4.00 - 10.00m slotted pipe.
BH104	SP50	2.00	9.95	Raised cover with gas bung, GL - 2.00m plain pipe, 2.00 - 9.95m slotted pipe.
BH105	SP50	2.00	10.00	Flush cover with gas bung, GL - 2.00m plain pipe, 2.00 - 10.00m slotted pipe.

Notes: SP50 = 50 mm ID standpipe

3.4.2 Post-fieldwork Monitoring

Post-field work monitoring was undertaken on separate visits on the 31st of August, 8th of September and 15th of September 2017. In all, three weekly visits to the site were made to record land gas emissions and groundwater levels.

During the first monitoring visit (31/08), after completion of the land gas emission monitoring, all wells were purged by removing three well volumes of groundwater and *in situ* groundwater monitoring and sampling was undertaken.

Where installations were purged dry, monitoring and sampling was conducted on groundwater recovered following recharging of groundwater in installations. Parameters measured during *in situ* monitoring were pH, dissolved oxygen, conductivity and redox potential.

On the second visit (07/09), after completion of the land gas emission monitoring, rising and falling head testing was conducted within the standpipes.

The results of the land gas/ groundwater monitoring and variable head testing are presented within Appendix E.

4 LABORATORY TESTING

4.1 General

Geotechnical and geo-environmental chemical testing was undertaken on selected samples obtained from the exploratory holes. The testing was scheduled by the geotechnical and/or geo-environmental engineer and the testing was undertaken by an Arcadis approved testing laboratory.

4.2 Geotechnical Laboratory Testing

The geotechnical tests detailed in Table 4-1 were carried out in accordance with either BS1377:1990: Parts 1 to 8 [14]; BRE SD 1:2005 [5]; or other methods as listed in Table 4-1. The complete results of the geotechnical laboratory testing are presented in Appendix F.

Table 4-1 Summary of geotechnical test data

Test	Method	No of Determinations
Moisture content	BS1377 Pt2-3.2	32
4-point liquid and plastic limit	BS 1377 Pt2-4.3 & 5.3	17
Particle Size Distribution - Wet sieving	BS1377 Pt2-9.2	16
Particle Size Distribution - Sedimentation	BS1377 Pt2-9.4	6
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould)	BS1377 Pt4-3.3	6
pH, water soluble sulphate; total sulphate, total sulphur, chloride, nitrate, magnesium	BS1377 Pt3 & BRE CP2/79	12

4.3 Geo-Environmental Laboratory Testing

Geo-environmental tests were undertaken on soil, groundwater and prepared leachate specimens obtained from the samples collected from the site. Testing was carried out for the contaminants detailed in
Table 4-2, Table 4-3 and **Error! Reference source not found.**.

The results of the chemical laboratory testing are presented in Appendix G. Details of the test methodology is presented with the test results.

Table 4-2 Summary of geo-environmental test data – soil matrix

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn),, pH, Cyanide Free & Total	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	34
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	Gas Chromatography –Mass Spectrometry (GC-MS)	34
Total Petroleum Hydrocarbon Criteria Working Croup (TPH CWG)	Gas Chromatography – Flame Ionisation Detector (GC-FID)	16
VOCs & SVOCs		1
Fractional Organic Carbon		34
Phenol (total), Cresol, Chlorinated Phenols		34

Table 4-3 Summary of geo-environmental test data – groundwater matirx

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn), pH, Speciated PAH, Cyanide Free & Total	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	7
PAHs	Gas Chromatography –Mass Spectrometry (GC-MS)	7
TPH CWG	Gas Chromatography – Flame Ionisation Detector (GC-FID)	7

5 REFERENCES

General References

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National Standards

6. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
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11. BS EN ISO 22282-2:2012. Geotechnical investigation and testing – Geohydraulic testing. Part 2: Water permeability tests in a borehole using open systems. British Standards Institution.
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15. BS EN ISO 17892-1: Geotechnical investigation and testing – Laboratory testing of soil – Determination of water content. British Standards Institution.
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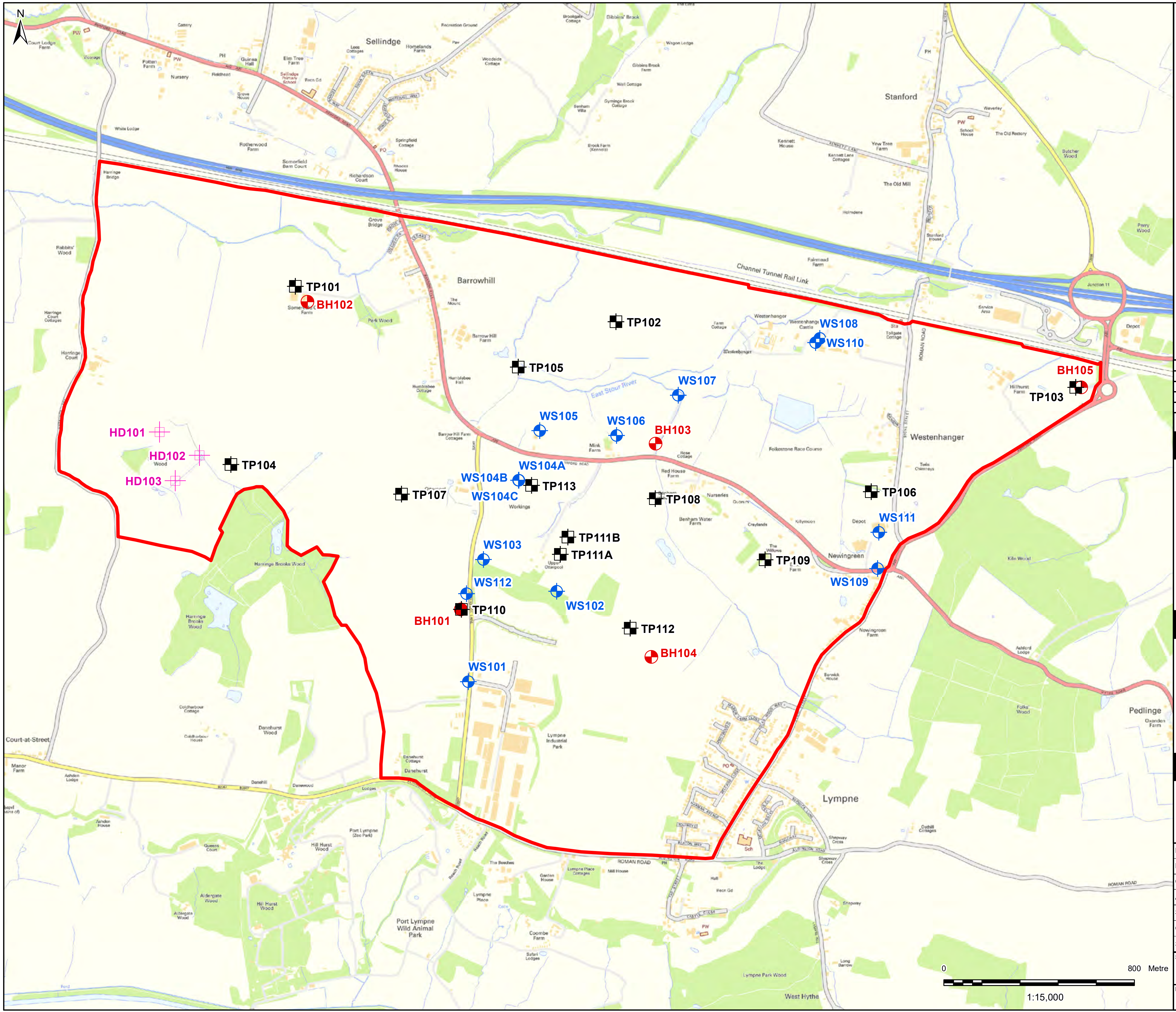
APPENDIX A

DRAWINGS

Drawing 5005-UA008926-UP31-S2-03-Ground Investigation Layout Plan



LEGEND

▭ Site Boundary
⊕ Rotary Boreholes
+ Hand Dug Pits
▣ Trial Pit Locations
⊕ Window Sample Locations

Rev	Date	Description	Drawn	Check	Approv
3	30/11/17	ISSUE 3	GS	JR	JV
2	27/09/17	ISSUE 2	DS	JR	AP
1	25/09/17	ISSUE 1	SS	JR	AP

Client **Folkestone**
Hythe & Romney Marsh
Shepway District Council
www.shepway.gov.uk

PROJECT:

OTTERPOOL PARK

Address
Folkestone,
Kent, UK

ARCADIS Design & Consultancy for natural and built assets

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34 York Way
London
N1 9AB

Coordinating office:
10 Medawar Road
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Guildford
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TITLE:

GROUND INVESTIGATION LAYOUT PLAN

Designed	J.RAVEN	Date 30-11-17	Signed
Drawn	D.SAWICKA	Date 30-11-17	Signed
Checked	J.RAVEN	Date 30-11-17	Signed
Approved	J.VENN	Date 30-11-17	Signed
Scale:	1:15,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	S2	Project Number:	UA008926

Suitability Description:
Issued for Information

Drawing Number: 5005-UA008926-UP31-S2
Revision: 03

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APPENDIX B

STANDARD PROCEDURES

B0 General Principles

This ground investigation was undertaken in general accordance with the principles of BS EN 1997-1 [1] and BS EN 1997-2 [2] and the advice given in BS5930:2015 [8], which, provides complimentary guidance on the application of the primary standards. Where the requirements of the ground investigation specification differ from these primary standards, the investigation methodology was adapted as required and specific notes regarding methods and techniques employed were made in the appropriate report sections.

B1 Buried Services

Service clearance was undertaken in accordance with Arcadis' common operating practice COP SA1. This document details the methods and safe working practices used to undertake excavations safely. Prior to breaking ground, services plans were consulted, and the area scanned using a Cable Avoidance Tool (CAT) with detected signals marked on the ground. For all investigation positions, other than for machine excavated trial pits, hand excavated inspection pits are completed to 1.20 m bgl prior to the use of drilling and boring plant.

B2 Sampling requirements

The selection of sample types and sampling techniques has been chosen to take account of the soil fabric, size and quality of sample required based on whether the soils mass properties or the intact material properties of the ground are to be determined in subsequent laboratory tests. BS EN ISO 22475-1 [4] describes three generic sample groups that are:

a. Sampling by drilling. Generally a disturbed sample recovered from the drilling tool or digging equipment, typically meeting Class 3 to Class 5 requirements, with the recovered material being stored in bulk bags or sealed jar or tub containers.
b. Sampling by sampler. Typically referred to as open tube or drive sampling in which a tube with a sharp cutting edge is driven into the ground either by static thrust or dynamically driven to give a relatively undisturbed sample of Class 1 or Class 2 but may result in a Class 3 sample.
c. Block sampling. Cylindrical large diameter samples or cuboid hand-cut samples usually relatively undisturbed Class 1 and Class 2.

The open-tube sampling equipment used on the site was of a type and design that conformed to BS EN ISO 22475-1. For the purpose of this ground investigation block sampling was not required.

Generally samples were assessed on site and any unexpected deterioration in sample quality was reported to the ground engineer by the lead drilling technician.

Sufficient and representative samples were taken to allow the geo-mechanical properties of the ground to be adequately characterised and to enable the sequence of soil strata to be described by an engineering geologist or geotechnical engineer.

Where samples have been taken for chemical tests the drilling method attempted to adopt dry drilling over the sampling range that generally was achieved by the use of drill casing to separate and isolate the upper soil layers and exclude groundwater. Cross-contamination was further reduced by regular cleaning of sampling tools. Sample integrity was maintained by sealing samples immediately on collection and storing the samples in a temperature controlled cool box. Samples were despatched from the site at the end of the shift on which they were collected or as required in the project specification. Details of best practice storage, preservation and decontamination measures undertaken are given below:

Task	Soil	Groundwater	Ground Gas
Storage	Glass jars and vials supplied by the laboratory were used for the collection of soil samples to be analysed for volatile compounds. Plastic one-litre tubs were used to collect soil samples for metals analysis.	Glass vials supplied by the laboratory were used for the collection of samples to be analysed for volatile compounds. Samples to be analysed for lower volatility compounds were stored in laboratory prepared glass bottles.	1.4L Canisters supplied by the laboratory.
Preservation	Filling of sample containers as far as practicable to minimise headspace and low storage temperature to minimise the potential for volatilisation and biodegradation of petroleum hydrocarbon compounds prior to analysis.		Not required.
Decontamination	Disposable gloves were worn and changed between sample collection to prevent cross-contamination.	Groundwater samples were collected using dedicated disposable tubing / bailers, that were changed between monitoring well locations in order to prevent cross-contamination.	Disposable gloves were worn and changed between sample collection to prevent cross contamination.
Transport	Samples stored in dedicated sample boxes provided by the laboratory. Sample details and analytical requests were recorded on the laboratory chain of custody form included with samples, prior to dispatching to laboratory for analysis. Samples were dispatched to the laboratory on the day of sampling.		

B3 Sample description

Sample description was undertaken by the Arcadis site geologist in accordance with BS 5930: 2015. The descriptions of the individual samples were used to identify the sequence of strata at the exploratory hole location and from which representative exploratory hole logs were drawn.

B4 *In situ* testing

In situ geotechnical tests were undertaken taking account of the investigation scope and requirement to attain the appropriate parameters required in the geotechnical design. The tests were undertaken in accordance with the requirements of the relevant parts of BS EN ISO 22476 [5, 6, 7] and other methods as follows:

Standard penetration testing

Standard penetration tests were carried out in accordance with BS EN ISO 22476-3, BS EN 1997-2 and the national Annex to BS EN 1997-2. The test records are presented on the borehole logs as blow counts for each increment with the N-value as the total number of blows of the four main test increments.

Where the N-value exceeds a total of 50 blows, the test reports the penetration in millimetres for the last test increment recorded, and the N value is indicated as greater than 50,

e.g. 4,5/12,14,18, 6 for 10 mm

indicates that the seating blows (4 and 5) were completed and that the test terminated in the 4th increment after penetrating 10 mm.

Where the seating blows exceeded 25 blows for less than 150 mm; the test was stopped and the rods remarked after which, the main drive was continued. The test is then reported as the number of blows in each seating drive for the recorded penetration with the results of the main drive given as above,

e.g. 14/11 for 45 mm/12,14,16, 8 for 10 mm.

In certain circumstances where groundwater in-flow may affect the test, particularly in fine sand or silt, low SPT blow counts may be recorded. Where the SPT blow count was very low, N values of 5 or less, the test was, at the discretion of the site engineer, continued for a further 300 mm, recording blows for each 75 mm increment. **This is not** a standard penetration test value, it does however give an indication of potential disturbance to the ground.

B5 Data transfer format

The data collated during the ground investigation has been organised and managed using the “AGS data format” that allows data transfer between different disciplines and organisations in accordance with BS 8574 [9].

B6 References

1. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
2. BS EN 1997-2. 2007. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution, 2010 (revised text).
3. BS EN ISO 22282-1:2012. Geotechnical investigation and testing – Geohydraulic testing. Part 1: General Rules. British Standards Institution.
4. BS EN ISO 22475-1. Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1 Technical principles for execution.
5. BS EN ISO 22476-1:2015. Geotechnical investigation and testing – Field testing – Part 1: Electrical cone and piezocone test. British Standards Institution
6. BS EN ISO 22476-2. Geotechnical investigation and testing – Field testing – Part 2: Dynamic Probing. British Standards Institution
7. BS EN ISO 22476-3 2005. Geotechnical investigation and testing – Field testing – Part 3: Standard penetration test. British Standards Institution
8. BS 5930: 2015. Code of practice for ground investigation. British Standards Institution.
9. BS 8574. Code of practice for the management of geotechnical data for ground engineering projects.
10. BS 1377-9. 1990. Methods of test for soils for civil engineering purposes. Part 9: In-situ tests. British Standards Institution.
11. TRL. 2004. Dynamic cone penetrometer tests and analysis. TRL Technical Report PR IN 277-04. Transport Research Laboratory, Crowthorne, England.

B7 Exploratory Hole Key

ARCADIS

Key to Exploratory Hole Symbols and Abbreviations

SAMPLE TYPES

B	Bulk disturbed sample	ES	Environmental soil sample	U	Undisturbed sample
C	Core sample	EW	Environmental water sample	UT	Undisturbed thin wall sample
CBR-D	Disturbed sample from CBR test area	G	Gas sample	W	Water sample
CBR-U	Undisturbed sample from CBR test area	L	Liner sample		
D	Small disturbed sample	SPT	SPT split spoon sample		

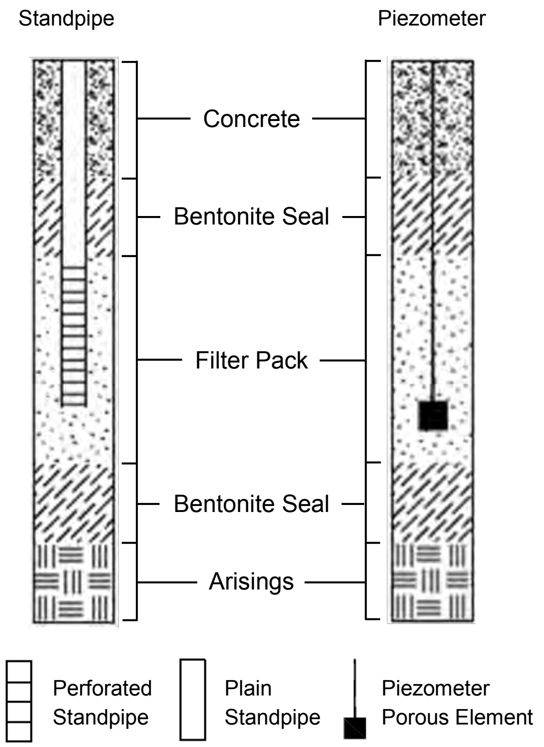
IN-SITU TESTING

SPTs	Standard Penetration Test (using a split spoon sampler)
SPTc	Standard Penetration Test (using a solid 60 degree cone)
N	Recorded SPT 'N' Value *
-/-	Blows/Penetration (mm) after seating blows totalling 150 mm
MX	Mexi Probe Test (records CBR as %)
HV	Hand Shear Vane Test (undrained shear strength quoted in kPa)
PP	Pocket Penetrometer Test (kg/m^3)
( )	Denotes residual test value
PID	Photo Ionisation Detector (ppm) *
Kf/Kr	Permeability Test (f = falling head, r = rising head quoted in ms^{-1})
HPD	High Pressure Dilatometer Test (pressure meter)
PKR	Packer / Lugeon Permeability Test
CBR	California Bearing Ratio Test

ROTARY CORE DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation (% of intact core >100 mm)
FI	Fracture Spacing (average fracture spacing; in mm, over indicated length of core) * *
NI	Non-Intact Core
AZCL	Assumed Zone of Core Loss

INSTALLATION & BACKFILL DETAILS



GROUNDWATER

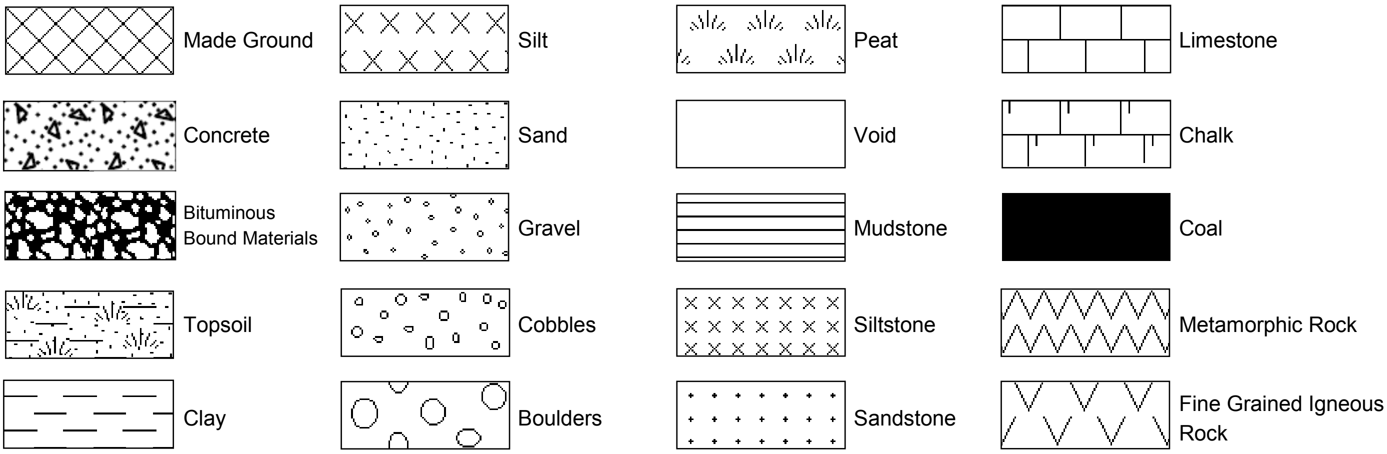
▽ Groundwater strike

▼ Standing water level after 20 minutes; 1st, 2nd etc (number denotes level order)

STRATUM BOUNDARIES

——— Unit boundary

STRATA LEGENDS - Note: Composite strata types are shown by combining symbols



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* Where a single value is quoted this is the uncorrected 'N' value for a full 300 mm test drive following a seating drive of 150mm. Where the full test drive penetration is not achieved the number of blows is quoted for the penetration below the test total of 300mm, e.g.: 50/75.

* * The minimum, average and maximum are shown e.g. 5/45/125.

APPENDIX C

EXPLORATORY HOLE LOGS

ARCADIS Rotary Borehole Log

BH101

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **101.23**	Start Date **23/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **610950.08**	Northing (OS mN) **136019.06**	End Date **23/08/2017**	**Sheet 1 of 1**

SAMPLES Depth	Type/ No.	TESTS Type/ No.	Results
0.30	ES1		
0.50	ES2		
0.50 - 0.75	B3		
0.75 - 1.00	B4		
1.00	ES5		
		SPT(S)	N=11 (1,1/2,3,3,3)
2.00	D7	SPT(S)	N=29 (2,2/4,6,8,11)
2.00	ES6		
3.00	D9	SPT(S)	N=25 (2,2/6,4,7,8)
3.00	ES8		
4.50	D11	SPT(S)	N=5 (1,2/1,1,2,1)
4.50	ES10		
		SPT(S)	N=11 (2,1/2,2,3,4)

DRILL LOG TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%
70 48 33	30 65 100	
56 13 0		
0 0 0		

STRATA Description	Depth (Thickness)	Level
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.	0.10	101.13
Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse quartz. [HEAD DEPOSITS]	1.60 (1.50)	99.63
Medium dense brownish green clayey fine to coarse SAND. Locally trending to very sandy CLAY. [HEAD DEPOSITS]	4.00 (2.40)	97.23
Loose to medium dense yellow and brown slightly silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular, fine to coarse quartz and sandstone. Residual soil. [SANDGATE FORMATION]	6.00 (2.00)	95.23
Medium strong to strong slightly to moderately weathered fractured grey micritic LIMESTONE. Fractures are very closely to closely spaced (30 - 100mm), and appear in two sets; subhorizontal open rough and stepped, and subvertical open rough and stepped to undulating. [HYTHE FORMATION] Low recovery below 7.00m due to high intensity of perpendicular fractures.	10.00 (4.00)	91.23

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	10.00	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
1.20	10.00		Air Mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
139	5.50		
116	10.00		

WATER ADDED

From	To	Volume (ltr)

Remarks

1. Groundwater not encountered. 2. Installation details; Raised cover with gas bung, GL - 6.00m plain pipe, 6.00 - 10.00m slotted pipe. 3. Backfill details; GL - 0.10m concrete, 0.10 - 5.50m bentonite, 5.50 - 10.00m gravel. 4. Terminated at scheduled depth.

Termination Depth:
10.00m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Commachio 305	**Arcadis Consulting (UK) Ltd**	**SAS**	**IP**

ARCADIS Rotary Borehole Log

BH102

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**73.39**	**24/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**610306.52**	**137311.61**	**24/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA				Install/ Backfill
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend	Depth (Thickness)	Level	
										TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.20) 0.20	73.19	
0.30	ES1									Firm brown sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS] Slightly gravelly below 0.50m.				
0.50 0.50 - 0.75	ES2 B3													
0.75 - 1.00	B4													
1.00	ES5													
1.20 - 2.00	B6	SPT(S)	N=7 (2,1/2,2,1,2)									(1.80)		
2.00 2.00 - 3.00	ES7 B8	SPT(S)	N=7 (1,1/2,1,2,2)									2.00	71.39	
										Loose brown slightly clayey silty fine to medium SAND. Local patches of greenish brown coarse SAND. [HEAD DEPOSITS]		(1.00)		
3.00	ES9	SPT(C)	N=9 (2,2/2,3,2,2)									3.00	70.39	
										Loose yellow and brown slightly silty fine to coarse SAND. Local bands of brown silt. Residual soil. [SANDGATE FORMATION]		(1.50)		
4.00 4.00	D11 ES10	SPT(S)	N=7 (1,2/2,1,2,2)											
												4.50	68.89	
										Very stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse mudstone and siltstone. Residual soil. [SANDGATE FORMATION]				
		SPT(C)	N=35 (3,4/8,9,8,10)									(2.60)		
6.50 6.50	D13 ES12	SPT(C)	N=29 (2,6/7,7,8,7)											
												7.10	66.29	
				100 90 87						Medium strong to strong slightly to moderately weathered fractured grey micritic LIMESTONE. Fractures are very closely to closely spaced (25 - 120mm), and appear in two sets; subhorizontal open rough and stepped, and subvertical open rough and stepped to undulating. [HYTHE FORMATION]				
				90 61 43	25 75 120							(2.90)		
				0 0 0						No recovery below 9.00m due to drilling induced fractures.				
												10.00	63.39	

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 1.20	1.20 10.00	Inspection Pit Rotary Core	1.20	10.00		Air Mist							139 116	4.20 10.00					

Remarks

1. Groundwater not encountered. 2. Installation details; Flush cover with gas bung, GL - 7.00m plain pipe, 7.00 - 10.00m slotted pipe. 3. Backfill details; GL - 0.10m concrete, 0.10 - 6.50m bentonite, 6.50 - 10.00m gravel. 4. Terminated at scheduled depth.

Termination Depth:
10.00m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Commachio 305	**Arcadis Consulting (UK) Ltd**	**SAS**	**IP**

ARCADIS Rotary Borehole Log

BH103

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**70.30**	**15/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611768.10**	**136716.11**	**17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS	
Depth	Type/ No.	Type/ No.	Results
0.30	ES1		
0.50	D3		
0.50	ES2		
0.50 - 0.75	B4		
0.75 - 1.00	B5		
1.00	D7		
1.00	ES6	SPT(S)	N=4 (1,1/1,1,1,1)
2.00	D9	SPT(S)	N=19 (1,1/3,4,6,6)
2.00	ES8		
2.50	D11		
2.50	ES10		
		SPT(S)	N>50 (25 for 20mm/50 for 55mm)

DRILL LOG		
TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%
75 53 11	40 105 170	
92 84 71		
80 61 21	10 45 80	
97 89 75	70 140 210	
33 33 33		

STRATA Description	Depth (Thickness)	Level
TOPSOIL; Crop over soft brown sandy clay. Sand is fine to medium.	(0.20) 0.20	70.10
Very soft to soft greenish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to angular, fine to coarse sandstone and quartz. [ALLUVIUM DEPOSITS] Very gravelly below 0.80m.	(0.80) 1.00	69.30
Firm becoming stiff brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse sandstone and limestone. [ALLUVIUM DEPOSITS]	(1.50) 2.50	67.80
Medium dense to dense greyish green slightly silty very gravelly fine to coarse SAND. Gravel is angular, fine to coarse limestone. Residual soil. [HYTHE FORMATION]	(0.30) 2.80	67.50
Medium strong to strong moderately weathered fractured grey micritic LIMESTONE. Fractures are very closely to closely spaced (40 - 170mm), and subhorizontal open rough and stepped. [HYTHE FORMATION] Fractures are open to tight below 4.80m. Fractures are very closely to closely, locally extremely closely spaced (10 - 80mm) below 5.50m. Band of completely weathered limestone from 6.10 - 6.20m. Band of completely weathered limestone from 6.80 - 7.00m. Fractures are closely to medium spaced (70 - 210mm) below 7.00m. Completely weathered below 8.50. Strong and slightly weathered below 9.50m.	(7.20) 10.00	60.30

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	10.00	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
1.20	10.00		Air Mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
17/08/2017 00:00	1.80	20	1.70	3.00	1.70

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
139	2.80		
116	10.00		

WATER ADDED

From	To	Volume (ltr)

Remarks

1. Groundwater encountered at 1.80m rising to 1.70m after 20 mins. 2. Installation details; Raised cover with gas bung, GL - 4.00m plain pipe, 4.00 - 10.00m slotted pipe. 3. Backfill details; GL - 0.10m concrete, 0.10 - 3.50m bentonite, 3.50 - 10.00m gravel. 4. Terminated at scheduled depth.

Termination Depth: 10.00m

AGS Arcadis Cymru House St Mellons Business Park Cardiff CF3 0EY

Unless otherwise stated: Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Commachio 305	**Arcadis Consulting (UK) Ltd**	**SAS**	**IP**

ARCADIS Rotary Borehole Log

BH104

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **94.56**	Start Date **21/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **611750.54**	Northing (OS mN) **135820.10**	End Date **21/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS		DRILL LOG				PROGRESS	
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%	Water Strikes	Date Time	Casing Water
		SPT(S)	N>50 (2,4/18,22,10 for 30mm)						
				40 35 24					
		SPT(S)	N>50 (4,10/18,25,7 for 10mm)						
							▼ ▽		
4.00 - 5.00	B1	SPT(S)	N=32 (6,7/8,8,7,9)						
		SPT(S)	N>50 (4,7/53,0 for 0mm)						
		SPT(S)	N=30 (4,4/7,6,8,9)						
7.00 - 8.00	B2								
		SPT(S)	N>50 (25,0 for 0mm/50 for 60mm)						
		SPT(S)	N>50 (16,9 for 30mm/27,23 for 40mm)						

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.20) 0.20	94.36	
Weak to medium strong completely weathered fractured grey micritic LIMESTONE. Recovered as slightly sandy cobbly angular fine to coarse GRAVEL of limestone. [HYTHE FORMATION]		(1.30) 1.50	93.06	
Medium strong to strong slightly to moderately weathered fractured grey micritic LIMESTONE. Fractures are very closely to closely spaced (10 - 30mm), and subhorizontal open rough and stepped. [HYTHE FORMATION]		(1.00) 2.50	92.06	
Dense green gravelly fine to coarse SAND. Gravel is angular, fine to coarse sandstone and quartz. Completely weathered SANDSTONE. [HYTHE FORMATION]		(2.00) 4.50	90.06	
Very dense green slightly clayey gravelly fine to coarse SAND. Gravel is angular, fine to coarse sandstone and quartz. Completely weathered SANDSTONE. [HYTHE FORMATION]		(2.30) 6.80	87.76	
Very stiff dark grey sandy CLAY. Sand is fine to coarse. Completely weathered MUDSTONE. [ATHERFIELD CLAY FORMATION]		(1.20) 8.00	86.56	
Extremely weak dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse mudstone. Completely weathered MUDSTONE. [ATHERFIELD CLAY FORMATION]		(1.95) 9.95	84.61	

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 0.20 1.50	0.20 1.50 9.95	Inspection Pit Rotary Open Hole Rotary Core	0.20	9.96		Air Mist	21/08/2017 00:00	4.00	20	3.80	8.00	4.00	139 116	6.50 9.95					

Remarks

1. Groundwater encountered at 4.00m, rising to 3.80m after 20 mins. 2. Installation details; Raised cover with gas bung, GL - 2.00m plain pipe, 2.00 - 9.95m slotted pipe.
3. Backfill details; GL - 0.10m concrete, 0.10 - 1.50m bentonite, 1.50 - 9.95m gravel. 4. Terminated at scheduled depth.

Termination Depth:
9.95m

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Commachio 305	**Arcadis Consulting (UK) Ltd**	**SAS**	**IP**

ARCADIS Rotary Borehole Log

BH105

Project
Otterpool Park
Client
Shepway District Council

Project No.
UA008926
Easting (OS mE)
613555.53

Ground Level (mAOD)
79.97
Northing (OS mN)
136952.23

Start Date
22/08/2017
End Date
22/08/2017

Scale
1:50

Sheet 1 of 2

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS	
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water
0.30	ES1								
0.50	ES2								
0.50 - 0.75	B3								
0.75 - 1.00	B4								
1.00	ES5								
		SPT(S)	N=14 (1,2/4,3,3,4)						
2.00 2.00	D7 ES6	SPT(S)	N=28 (1,4/6,7,7,8)						
3.00 3.00	D9 ES8	SPT(S)	N=30 (2,5/7,6,8,9)						
4.00 4.00	D11 ES10	SPT(S)	N=57 (5,8/10,15,18,14)				▼ ▽		
5.00	D12								
		SPT(S)	N=22 (4,5/5,4,6,7)						
6.00	D13								
7.00	D14	SPT(S)	N=49 (6,8/9,11,15,14)						
		SPT(S)	N=41 (3,4/6,7,10,18)						
9.00	D15								
		SPT(S)	N>50 (25 for						

STRATA Description	Depth (Thickness)	Level
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.	(0.20) 0.20	79.77
MADE GROUND; Lean mix CONCRETE.	0.30	79.67
Firm orange brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse limestone and quartz. [HEAD DEPOSITS]	(0.45) 0.75	79.22
Medium dense orange slightly gravelly very clayey fine to coarse SAND. Gravel is angular to subangular, fine to coarse limestone and quartz. [HEAD DEPOSITS]	(1.25) 2.00	77.97
Medium dense grey very silty fine to medium SAND. Locally very clayey. [HEAD DEPOSITS]	(1.50) 3.50	76.47
Very dense becoming very dense dark grey fine to medium SILT and SAND. Completely weathered SILTSTONE. [SANDGATE FORMATION]	(2.00) 5.50	74.47
Stiff becoming hard dark grey slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular, fine to coarse siltstone. [SANDGATE FORMATION]	(4.50) 10.00	69.97

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	10.00	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
1.20	10.00		Air Mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
23/08/2017 00:00	4.20	20	4.00	5.50	4.00

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
139	5.50		
116	10.00		

WATER ADDED

From	To	Volume (ltr)

Remarks
1. Groundwater encountered at 4.20m, rising to 4.00m after 20 mins. 2. Installation details; Flush cover with gas bung, GL - 2.00m plain pipe, 2.00 - 10.00m slotted pipe.
3. Backfill details; GL - 0.10m concrete, 0.10 - 1.50m bentonite, 1.50 - 10.00m gravel. 4. Terminated at scheduled depth.

Termination Depth:
10.00m

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used
Commachio 305

Contractor
Arcadis Consulting (UK) Ltd

Logged By
SAS

Checked By
IP

ARCADIS Rotary Borehole Log

BH105

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**79.97**	**22/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**613555.53**	**136952.23**	**22/08/2017**	**Sheet 2 of 2**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA				
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
			50mm/33,17 for 20mm)											

DRILLING TECHNIQUE			FLUSH DETAILS			
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type
0.00 1.20	1.20 10.00	Inspection Pit Rotary Core	1.20	10.00		Air Mist

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
23/08/2017 00:00	4.20	20	4.00	5.50	4.00

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
139 116	5.50 10.00		

WATER ADDED		
From	To	Volume (ltr)

Remarks

1. Groundwater encountered at 4.20m, rising to 4.00m after 20 mins. 2. Installation details; Flush cover with gas bung, GL - 2.00m plain pipe, 2.00 - 10.00m slotted pipe.
3. Backfill details; GL - 0.10m concrete, 0.10 - 1.50m bentonite, 1.50 - 10.00m gravel. 4. Terminated at scheduled depth.

Termination Depth:
10.00m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Commachio 305	**Arcadis Consulting (UK) Ltd**	**SAS**	**IP**

Dynamic Sample Log

WS101

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**102.28**	**16/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**610984.97**	**135716.41**	**16/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.05 - 0.15	ES1	0.05	PID	<1ppm	
0.50 - 0.55	ES2	0.50	PID	<1ppm	
0.50 - 0.70	B10				
0.50 - 0.70	D6				
0.70 - 1.00	B11				
0.70 - 1.00	D7	1.00	PID	<1ppm	
1.00 - 1.05	ES3				
1.20 - 1.80	B12	1.20	SPT(S)	N=11 (1,2/2,2,3,4)	0
		1.20	PID	<1ppm	
		1.50	PID	<1ppm	
1.80 - 1.90	D8				
1.90 - 2.00	ES4				
2.00 - 2.80	B13	2.00	SPT(S)	N=13 (1,2/2,3,4,4)	0
		2.00	PID	<1ppm	
		2.50	PID	<1ppm	
2.80 - 2.90	D9				
2.90 - 3.00	ES5				
		3.00	SPT(S)	N>50 (4,2/2,10,38,0 for 0mm)	0
		3.00	PID	<1ppm	

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets. Rare fragments of tile and brick.		(0.20) 0.20	102.08	
MADE GROUND; Dark greenish brown slightly gravelly sandy CLAY with rare cobbles of concrete. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint, brick and concrete.		(1.00) 1.20	101.08	
Medium dense greenish brown clayey SAND. Sand is fine to coarse. [HEAD DEPOSITS]		(0.80) 2.00	100.28	
Medium dense orangish brown clayey SAND. Sand is fine to coarse. [HEAD DEPOSITS]		(1.00) 3.00	99.28	

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.00	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	3.00	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Arisings
0.20	3.00	Bentonite

Remarks

1. Groundwater not encountered. 2. Terminated at 3.00m due to refusal.

Termination Depth:
3.00m

HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS Dynamic Sample Log

WS102A

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**94.65**	**17/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611356.29**	**136095.88**	**17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.00 - 0.20 0.00 - 0.20	D2 ES1	0.10	PID	<2 ppm		TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets. Limestone rockhead encountered at 0.30m.		(0.30) 0.30	94.35	

DRILLING TECHNIQUE			WATER OBSERVATIONS						HOLE/CASING DIAMETER				BACKFILL		
From	To	Technique	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	Top	Base	Backfill
0.00	0.30	Inspection Pit							300	0.30	0	0.00	0.00	0.29	Arisings

Remarks

1. Groundwater not encountered. 2. Terminated at 0.30m due to refusal on rockhead.

Termination Depth: 0.30m

HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

Dynamic Sample Log

WS102B

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**94.65**	**17/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611356.28**	**136095.87**	**17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
						TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets. Limestone rockhead encountered at 0.20m.		(0.20) 0.20	94.45	

DRILLING TECHNIQUE			WATER OBSERVATIONS						HOLE/CASING DIAMETER				BACKFILL		
From	To	Technique	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	Top	Base	Backfill
0.00	0.20	Inspection Pit							300	0.20	0	0.00	0.00	0.21	Arisings

Remarks

1. Groundwater not encountered. 2. Terminated at 0.20m due to refusal on rockhead.

Termination Depth: 0.20m

HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS Dynamic Sample Log

WS103

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **94.59**	Start Date **15/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **611049.65**	Northing (OS mN) **136228.45**	End Date **15/08/2017**	**Sheet 1 of 1**

SAMPLES

Depth	Type/ No.
0.10 - 0.20	ES1
0.20 - 0.35	D5
0.50 - 0.55	ES2
0.50 - 0.70	B15
0.50 - 0.70	D6
0.70 - 0.90	B13
0.70 - 0.90	D7
1.00 - 1.05	ES3
1.10 - 1.20	D8
1.20 - 1.70	B14
1.70 - 1.80	ES4
1.80 - 2.00	D9
2.00 - 2.80	B16
2.80 - 3.00	D10
3.00 - 3.20	B17
3.20 - 3.80	B18
3.80 - 4.00	D11
4.00 - 4.80	B19
4.80 - 5.00	D12

TESTS

Depth	Type/ No.	Results	Water Strikes
0.10	PID	<1ppm	
0.40	PID	<1ppm	
0.90	PID	<1ppm	
1.20	SPT(S)	N=16 (2,2/3,4,5,4)	0
1.20	PID	<1ppm	
1.50	PID	<1ppm	
2.00	SPT(S)	N=16 (3,3/4,4,4,4)	0
2.00	PID	<1ppm	
2.50	PID	<1ppm	
3.00	SPT(S)	N=4 (1,1/1,1,1,1)	0
3.00	PID	<1ppm	
3.20	PID	<1ppm	
3.50	PID	<1ppm	
4.00	SPT(S)	N=4 (1,1/1,1,1,1)	0
4.00	PID	<1ppm	
4.50	PID	<1ppm	
5.00	SPT(S)	N=8 (1,2/2,2,2,2)	0
5.00	PID	<1ppm	

STRATA

Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.35) 0.35	94.24	
Firm brown slightly gravelly CLAY. Gravel is sub-rounded to sub-angular, fine to coarse flint and limestone. [HEAD DEPOSITS]		(0.55) 0.90	93.69	
Stiff greenish brown slightly gravelly CLAY. Gravel is sub-rounded to sub-angular, fine to coarse flint and limestone. [HEAD DEPOSITS]		(0.30) 1.20	93.39	
Stiff greenish brown mottled orange sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		(0.80) 2.00	92.59	
Medium dense brown slightly clayey SAND. Sand is fine to medium. [HEAD DEPOSITS]		(1.20) 3.20	91.39	
Loose orange mottled cream clayey SAND. Sand is fine to medium. [HEAD DEPOSITS]		(0.80) 4.00	90.59	
Soft orange mottled red sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		(1.00) 5.00	89.59	

DRILLING TECHNIQUE

From	To	Technique
0.00	1.20	Inspection Pit
1.20	5.00	Window Sample

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
116	5.00	0	0.00

BACKFILL

Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	5.00	Gravel

Remarks

1. Groundwater seepage encountered at 2.50m. 2. Terminated at scheduled depth.

Termination Depth:
5.00m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

**Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm),
Thickness (m), Level (mOD).**

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS

Dynamic Sample Log

WS104A

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **82.61**	Start Date **17/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **611159.6**	Northing (OS mN) **136549.0**	End Date **17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
		0.30	PID	<1ppm	▼	MADE GROUND; Black slightly clayey sub-rounded to angular fine to coarse GRAVEL of tarmac, concrete and limestone.	▨	(0.30) 0.30	82.31	

DRILLING TECHNIQUE		
From	To	Technique
0.00	0.30	Inspection Pit

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
17/08/2017 08:55	0.30	5	0.20	0.00	0.00

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
300	0.30	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.30	Arisings

Remarks

1. Groundwater encountered at 0.30m, rising to 0.20m after 20 mins. 2. Terminated at 0.30m due to refusal

Termination Depth:
0.30m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS

Dynamic Sample Log

WS104B

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**82.49**	**17/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611158.8**	**136550.1**	**17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
					▼	MADE GROUND; Grey clayey sub-rounded to angular fine to coarse GRAVEL of tarmac, concrete and limestone.	☒	(0.15) 0.15	82.34	

DRILLING TECHNIQUE		
From	To	Technique
0.00	0.15	Inspection Pit

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
17/08/2017 12:10	0.15	5	0.10	0.00	0.00

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
300	0.15	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.15	Arisings

Remarks

1. Groundwater encountered at 0.15m, rising to 0.10m after 20 mins. 2. Terminated at 0.15m due to refusal.

Termination Depth:
0.15m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

Dynamic Sample Log

WS104C

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**82.44**	**17/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611153.3**	**136615.9**	**17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes
0.10 - 0.20	D6				
0.10 - 0.20	ES1	0.20	PID	<1ppm	
0.50 - 0.55	ES2	0.50	PID	<1ppm	
0.50 - 0.70	B12				
0.50 - 0.70	D7				
0.70 - 1.00	B13				
0.70 - 1.00	D8				
1.00 - 1.05	ES3	1.00	PID	<1ppm	
1.20 - 1.80	B14	1.20	SPT(S)	N=4 (1,1/1,1,1,1)	0
		1.50	PID	<1ppm	
1.80 - 1.90	ES4				
1.90 - 2.00	D9				
2.00 - 2.80	B15	2.00	SPT(S)	N=18 (1,1/1,3,5,9)	0
		2.00	PID	<1ppm	
		2.50	PID	<1ppm	
2.80 - 2.90	ES5				
2.90 - 3.00	D10				
3.00 - 3.90	B16	3.00	SPT(S)	N=7 (1,1/2,2,1,2)	0
		3.00	PID	<1ppm	
		3.50	PID	<1ppm	
3.90 - 4.00	D11				
		4.00	SPT(S)	N>50 (25,0 for 0mm/50,0 for 0mm)	0
		4.00	PID	<1ppm	

STRATA	Depth (Thickness)	Level
Description		
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.	(0.20) 0.20	82.24
MADE GROUND; Lean-mix CONCRETE.	0.30	82.14
Soft locally stiff creamy brown gravelly CLAY. Gravel is sub-angular to angular, fine to coarse limestone. [HEAD DEPOSITS] Creamy brown mottled grey colouration.	(3.70) 4.00	78.44

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	4.00	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	4.00	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	4.00	Gravel

Remarks

1. Groundwater seepage encountered at 3.90m. 2. Terminated at 4.00m due to refusal.

Termination Depth:
4.00m

HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS **Dynamic Sample Log** **WS105**

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**70.00**	**14/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611285.92**	**136769.95**	**14/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.10 - 0.23	ES1				
		0.15	PID	<1ppm	
		0.25	PID	<1ppm	
0.50 - 0.55	D5				
0.50 - 0.55	ES2				
0.50 - 0.70	B9				
0.70 - 1.00	B10				
1.00 - 1.05	ES3				
1.20 - 1.40	B11	1.20	SPT(S)	N=17 (1,1/3,4,4,6)	0
		1.50	PID	<1ppm	
1.80 - 2.00	D6				
1.80 - 2.00	ES4				
2.00 - 2.25	B12	2.00	SPT(S)	N=27 (3,4/4,5,9,9)	0
2.25 - 2.75	B13	2.25	PID	<1ppm	
2.50 - 2.55	D7				
		2.60	PID	<1ppm	
		2.70	PID	<1ppm	
2.75 - 2.85	B14				
2.75 - 2.85	D8	2.85	SPT(S)	N>50 (5,5/11,13,17,9 for 15mm)	0

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.25) 0.25	69.74	
Firm to stiff grey mottled orange slightly sandy CLAY. Sand is fine [HEAD DEPOSITS]		(0.65) 0.90	69.10	
Stiff greenish grey mottled orange slightly sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.50) 1.40	68.60	
Soft grey mottled orange slightly sandy SILT. Sand is fine to medium. [HEAD DEPOSITS]		(0.20) 1.60	68.40	
Stiff to very stiff grey mottled orange sandy SILT. Sand is fine to medium. [HEAD DEPOSITS]		(0.65) 2.25	67.74	
Stiff dark greenish brown mottled black slightly sandy SILT. Sand is fine to coarse. [HEAD DEPOSITS] Bands of thinly laminated orange SAND.		(0.45) 2.70	67.30	
Very stiff black slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular, fine to coarse siltstone. Residual soil. [SANDGATE FORMATION]		(0.15) 2.85	67.14	

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	2.85	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	2.85	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	2.85	Gravel

Remarks

1. Groundwater seepage encountered at 2.40m. 2. Terminated at 2.85m due to refusal.

Termination Depth:
2.85m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

Dynamic Sample Log

WS106

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**69.87**	**14/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611608.35**	**136750.44**	**14/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.10 - 0.20	ES1	0.10	PID	<1ppm	
		0.30	PID	<1ppm	
0.50 - 0.55	ES2				
0.50 - 0.70	B7				
0.50 - 0.70	D5				
0.90 - 1.00	B8	0.90	PID	<1ppm	
0.90 - 1.00	D6				
1.00 - 1.10	ES3				
1.20 - 1.40	B9	1.20	SPT(S)	N=8 (1,1/2,2,3,1)	0
1.40 - 2.00	B10	1.40	PID	<1ppm	
1.80 - 1.90	ES4				
		2.00	SPT(S)	N=22 (1,7/8,5,5,4)	0
		2.00	PID	<1ppm	
2.30 - 3.00	B11	2.30	PID	<1ppm	
		3.00	SPT(S)	N>50 (9,15/50 for 20mm)	0

STRATA				Install/ Backfill
Description	Legend	Depth (Thickness)	Level	
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30) 0.30	69.57	
Firm light brown sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.60) 0.90	68.97	
Firm orange and brown sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		(0.50) 1.40	68.47	
Stiff to very stiff orange and brown brown mottled grey slightly sandy CLAY. Sand is fine. [HEAD DEPOSITS]		(0.90) 2.30	67.57	
Firm brownish white clayey subangular to angular fine to coarse GRAVEL of limestone. Residual soil. [HYTHE FORMATION]		(0.70) 3.00	66.87	

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.00	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	3.00	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	3.00	Gravel

Remarks

1. Groundwater seepage encountered at 1.90m. 2. Terminated at 3.00m due to refusal.

Termination Depth: 3.00m

HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS Dynamic Sample Log

WS107

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**68.45**	**15/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611867.54**	**136919.17**	**15/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.10 - 0.15	ES1	0.10	PID	<1ppm		TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30)		
0.10 - 0.30	D5									
		0.30	PID	<1ppm				0.30	68.15	
						Loose orange and brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to subangular, fine to coarse limestone. [ALLUVIUM DEPOSITS]				
0.50 - 0.55	ES2									
0.50 - 0.70	B10									
0.50 - 0.70	D6									
0.70 - 1.00	B11	0.80	PID	<1ppm				(1.10)		
0.70 - 1.00	D7									
1.00 - 1.05	ES3									
1.20 - 1.40	B12	1.20	SPT(S)	N=8 (1,2/2,2,2,2)	0					
1.40 - 1.60	B13	1.40	PID	<1ppm				1.40	67.05	
						Firm to stiff orange and brown mottled grey slightly sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]				
1.60 - 1.80	ES4									
1.80 - 2.00	B8							(0.80)		
2.00 - 2.20	B14	2.00	SPT(S)	N=13 (1,2/3,3,3,4)	0					
2.00 - 2.80	B15	2.00	PID	<1ppm						
		2.20	PID	<1ppm				2.20	66.25	
						Medium dense to dense green slightly clayey SAND. Sand is fine to coarse. [HEAD DEPOSITS]				
								(0.80)		
2.80 - 3.00	B9									
		3.00	SPT(S)	N=42 (5,7/7,8,9,18)	0			3.00	65.45	
		3.00	PID	<1ppm						

DRILLING TECHNIQUE		
From	To	Technique

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
15/08/2017 10:30	2.85	20	2.00	0.00	0.00

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	3.00	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	3.00	Gravel

Remarks

1. Groundwater encountered at 2.80m, rising to 2.00m after 20 mins. 2. Terminated at 3.00m due to refusal.

Termination Depth:
3.00m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
	Arcadis Consulting (UK) Ltd		**IP**

ARCADIS Dynamic Sample Log

WS108

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **73.99**	Start Date **15/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **612461.34**	Northing (OS mN) **137157.15**	End Date **16/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes
0.05 - 0.15	ES1	0.05	PID	<1ppm	
0.20 - 0.40	D7	0.20	PID	<1ppm	
0.50 - 0.55	ES2	0.50	PID	<1ppm	
0.50 - 0.70	B11				
0.50 - 0.70	D5				
0.70 - 1.00	B12				
0.70 - 1.00	D6	1.00	PID	<1ppm	
1.00 - 1.05	ES3				
1.20 - 2.00	B15	1.20	SPT(S)	N=8 (1,2/2,2,2,2)	0
		1.20	PID	<1ppm	
1.60 - 1.70	D8				
1.80 - 2.00	ES4				
2.00 - 2.40	B13	2.00	SPT(S)	N=48 (4,5/8,8,17,15)	0
		2.00	PID	<1ppm	
2.20 - 2.30	D10				
2.40 - 2.80	B14	2.50	PID	<1ppm	
2.70 - 2.80	D9				
		2.80	SPT(S)	N=39 (4,4/5,8,11,15)	0

STRATA			
Description	Legend	Depth (Thickness)	Level
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.20) 0.20	73.79
Soft to firm orange and brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to subangular, fine to coarse flint. [HEAD DEPOSITS]		(0.25) 0.45	73.54
Firm orange and brown slightly sandy gravelly CLAY. Sand is fine to coar. Gravel is subangular to angular, fine to coarse limestone and flint. [HEAD DEPOSITS]		(0.75) 1.20	72.79
Firm to stiff grey mottled orange sandy CLAY. Sand is fine to medium [HEAD DEPOSITS]		(1.20) 2.40	71.59
Stiff to very stiff grey mottled orange very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.40) 2.80	71.19

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	2.80	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	2.80	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	2.80	Gravel

Remarks

1. Groundwater seepage encountered at 2.40m. 2. Terminated at 2.80m due to refusal.

Termination Depth: 2.80m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS Dynamic Sample Log

WS109

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **83.26**	Start Date **16/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **612704.14**	Northing (OS mN) **136191.38**	End Date **16/08/2017**	**Sheet 1 of 1**

SAMPLES Depth	SAMPLES Type/ No.	TESTS Depth	TESTS Type/ No.	TESTS Results	Water Strikes
0.05 - 0.15	D4	0.10	PID	<1ppm	
0.10 - 2.00	ES1				
0.30 - 0.40	ES2	0.30	PID	<1ppm	
0.50 - 0.70	B10				
0.50 - 0.70	D5				
0.70 - 1.00	B11				
0.70 - 1.00	D6	0.80	PID	<1ppm	
1.00 - 1.05	ES3				
1.20 - 1.80	B12	1.20	SPT(S)	N=4 (1,1/1,1,1,1)	0
		1.20	PID	<1ppm	
1.80 - 2.00	D7				
2.00 - 2.50	B13	2.00	SPT(S)	N=12 (3,3/3,3,3,3)	0
		2.00	PID	<1ppm	
2.50 - 2.80	B14	2.50	PID	<1ppm	
2.80 - 2.90	D8				
2.90 - 3.00	D9	2.90	PID	<1ppm	

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.20) 0.20	83.06	
MADE GROUND: Soft brown mottled black slightly sandy clayey subrounded to subangular fine to coarse GRAVEL of limestone, flint and quartz.		(0.50) 0.70	82.56	
Soft brownish grey mottled orange CLAY. [HEAD DEPOSITS]		(0.50) 1.20	82.06	
Soft to firm blueish grey mottled orange SILT. [HEAD DEPOSITS]		(1.30) 2.50	80.76	
Firm grey mottled orange CLAY. [HEAD DEPOSITS]		(0.40) 2.90	80.36	
Firm green mottled orange slightly sandy SILT. Sand is fine to medium. [HEAD DEPOSITS]		3.00	80.26	

DRILLING TECHNIQUE

From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.00	Window Sample

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
116	3.00	0	0.00

BACKFILL

Top	Base	Backfill
0.00	0.50	Arisings
0.50	3.00	Bentonite

Remarks

1. Groundwater seepage encountered at 1.80m. 2. Terminated at 3.00m due to refusal. 3. Hole collapsed from 3.00m to 2.00m due to water strike.

Termination Depth:
3.00m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

Dynamic Sample Log

WS110

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **73.64**	Start Date **16/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **612443.89**	Northing (OS mN) **137140.44**	End Date **16/08/2017**	**Sheet 1 of 1**

SAMPLES

Depth	Type/ No.
0.05 - 0.15	D5
0.05 - 0.15	ES2
0.50 - 0.55	ES1
0.50 - 0.70	B15
0.50 - 0.70	D6
0.70 - 1.00	B16
0.70 - 1.00	D7
1.00 - 1.05	ES3
1.30 - 1.80	B12
1.70 - 1.80	D11
1.80 - 2.00	D8
2.00 - 2.10	ES4
2.10 - 2.20	D9
2.20 - 2.60	B14
2.60 - 2.90	B13
2.90 - 3.00	D10

TESTS

Depth	Type/ No.	Results	Water Strikes
0.05	PID	<1ppm	
0.20	PID	<1ppm	
0.50	PID	<1ppm	
0.60	PID	<1ppm	
1.00	PID	<1ppm	
1.20	SPT(S)	N=7 (2,2/1,2,2,2)	0
1.30	PID	<1ppm	
1.80	PID	<1ppm	
2.00	SPT(S)	N=26 (4,4/5,5,6,10)	0
2.00	PID	<1ppm	
2.50	PID	<1ppm	
2.70	PID	<1ppm	
3.00	SPT(S)	N=51 (9,10/10,15,12,14)	0

STRATA

Description	Depth (Thickness)	Level
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.	(0.15) 0.15	73.49
Soft orange and brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to subangular, fine to coarse flint and limestone. [HEAD DEPOSITS]	(0.35) 0.50	73.14
Soft to firm orange and brown sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]	(0.80) 1.30	72.34
Firm brownish grey mottled orange CLAY. [HEAD DEPOSITS]	(0.50) 1.80	71.84
Soft brownish grey mottled orange sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]	(0.20) 2.00	71.64
Stiff brownish grey mottled orange CLAY. [HEAD DEPOSITS]	(0.60) 2.60	71.04
Dense brownish grey mottled orange slightly silty fine to coarse SAND. [HEAD DEPOSITS]	(0.40) 3.00	70.64

DRILLING TECHNIQUE

From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.00	Window Sample

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
116	3.00	0	0.00

BACKFILL

Top	Base	Backfill
0.00	0.30	Arisings
0.30	3.00	Bentonite

Remarks

1. Groundwater not encountered. 2. Terminated at 3.00m due to refusal.

Termination Depth: 3.00m

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS Dynamic Sample Log

WS111

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **82.23**	Start Date **17/08/2017**	Scale **1:50**
Client **Shepway District Council**	Easting (OS mE) **612710.09**	Northing (OS mN) **136342.97**	End Date **17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
						MADE GROUND; Lean-mix CONCRETE.	▨	(0.40) 0.40	81.83	
0.38 - 0.48	D2					MADE GROUND; Dark grey gravelly CLAY. Gravel is angular, fine to coarse limestone and flint.	▨	0.48	81.75	
0.48 - 0.60	ES1	0.50	PID	<1ppm		MADE GROUND; Black sandy subrounded to angular fine to coars GRAVEL of brick, flint and limestone.	▨	(0.12) 0.60	81.63	

DRILLING TECHNIQUE			WATER OBSERVATIONS						HOLE/CASING DIAMETER				BACKFILL		
From	To	Technique	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	Top	Base	Backfill
0.00	0.60	Inspection Pit											0.00 0.15	0.15 0.60	Concrete Arisings

Remarks

1. Groundwater encountered. 2. Terminated at 0.60m due to groundwater inflow.

Termination Depth:
0.60m

AGS
HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

Dynamic Sample Log

WS112

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**99.93**	**16/08/2017**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**610977.80**	**136085.15**	**16/08/2017**	**Sheet 1 of 1**

SAMPLES	
Depth	Type/ No.
0.00 - 0.10	ES1
0.50 - 0.55	ES2
0.50 - 0.70	B11
0.50 - 0.70	D6
0.70 - 1.00	B12
0.70 - 1.00	D7
1.00 - 1.05	ES3
1.20 - 1.80	B13
1.80 - 1.90	ES4
1.90 - 2.00	D8
2.20 - 2.70	B14
2.70 - 2.80	ES5
2.80 - 3.00	D9
3.00 - 3.40	B15
3.40 - 3.50	D10

TESTS			
Depth	Type/ No.	Results	Water Strikes
0.10	PID	<1ppm	
0.50	PID	<1ppm	
1.00	PID	<1ppm	
1.20	SPT(S)	N=4 (1,1/1,1,1,1)	0
1.20	PID	<1ppm	
1.50	PID	<1ppm	
2.00	SPT(S)	N=14 (1,2/3,3,4,4)	0
2.00	PID	<1ppm	
2.20	PID	<1ppm	
2.50	PID	<1ppm	
3.00	SPT(S)	N=19 (2,3/4,4,5,6)	0
3.00	PID	<1ppm	
3.50	SPT(S)	N=45 (7,8/9,9,9,18)	0
3.50	PID	<1ppm	

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30) 0.30	99.63	
Soft light brown slightly sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		(0.90) 1.20	98.73	
Soft to firm light brown CLAY. [HEAD DEPOSITS]		(1.00) 2.20	97.73	
Medium dense to very dense green mottled orange clayey SAND. Sand is fine to medium. [HEAD DEPOSITS]		(1.30) 3.50	96.43	

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.50	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	3.50	0	0.00

BACKFILL		
Top	Base	Backfill
0.00	0.20	Concrete
0.20	1.00	Bentonite
1.00	3.50	Gravel

Remarks

1. Groundwater seepage encountered at 2.90m. 2. Terminated at 3.50m due to refusal.

Termination Depth:
3.50m

HCL House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm),
Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dando Terrier	**Arcadis Consulting (UK) Ltd**	**LKW**	**IP**

ARCADIS Trial Pit Log

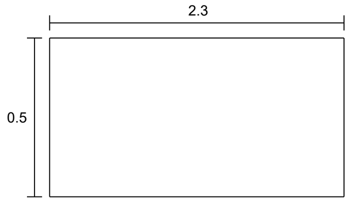
TP101

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **71.59**	Start Date **15/08/2017**	Scale **1:25**
Client **Shepway District Council**	Easting (OS mE) **610259.33**	Northing (OS mN) **137376.17**	End Date **15/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.20	B1				
0.20	D2				
0.20	ES3				
0.50	B4				
0.50	D5				
0.50	ES6				
1.00	B7				
1.00	D8				
1.00	ES9				
1.50	B10				
1.50	D1				

STRATA		Depth (Thickness)	Level	Install/ Backfill
Description	Legend			
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30) 0.30	71.29	
Soft to firm yellowish brown slightly sandy gravelly CLAY with rare cobbles of limestone. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse limestone. [HEAD DEPOSITS]		(1.70) 2.00	69.59	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at 2.00m due to refusal on bedrock.

Termination Depth:

2.00m

AGS

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

ARCADIS Trial Pit Log

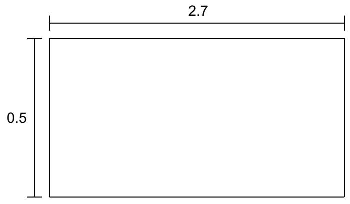
TP102

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**68.56**	**14/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611605.45**	**137227.56**	**14/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.30	B1				
0.30	D2				
0.30	ES3				
0.60	B4				
0.60	D5				
0.60	ES6				
1.10	B7				
1.10	D8				
1.10	ES9				
1.80	B10				
1.80	D1				
2.30	B2				
2.30	D3				

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.	▨	(0.40) 0.40	68.16	▥
Brown mottled orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint. [HEAD DEPOSITS]	▨	(0.40) 0.80	67.76	▥
Firm grey mottled orangish brown sandy CLAY. Becoming very sandy with depth. [HEAD DEPOSITS]	▨	(1.70) 2.50	66.06	▥

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.50m

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

ARCADIS Trial Pit Log

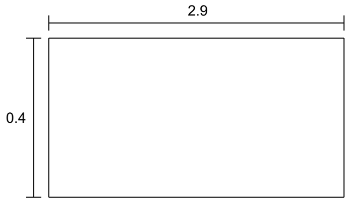
TP103

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**79.73**	**18/07/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**613536.69**	**136951.58**	**18/07/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.10	ES1				
0.10 - 0.20	D2	0.10	PID	<1ppm	
0.20 - 0.30	B6	0.20	PID	<1ppm	
0.35 - 0.45	B7				
0.35 - 0.45	D	0.40	PID	<1ppm	
0.50 - 0.70	B8	0.50	PID	<1ppm	
0.50 - 0.70	D1				
0.70 - 1.00	B9	0.70	PID	<1ppm	
0.70 - 1.00	D2				
		1.00	PID	<1ppm	
1.50	B10	1.50	PID	<1ppm	
1.50	D3				
2.00	B11	2.00	PID	<1ppm	
2.00	D4				
2.50	B12	2.50	PID	<1ppm	
2.50	D5				

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
MADE GROUND; Brown mottled black CLAY.		(0.10) 0.10	79.63	
MADE GROUND; Brown clayey GRAVEL. Gravel is rounded to subangular, fine to coarse flint, limestone and sandstone.		(0.25) 0.35	79.38	
Soft grey mottled orange slightly gravelly CLAY. Gravel is rounded to angular, fine to coarse flint, limestone and sandstone. [HEAD DEPOSITS]		(0.10) 0.45	79.28	
Soft becoming firm grey mottled orange CLAY. [HEAD DEPOSITS]		(0.25) 0.70	79.03	
Firm grey mottled orange sandy SILT. [HEAD DEPOSITS]		(1.80) 2.50	77.23	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.50m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**LKW**	**IP**

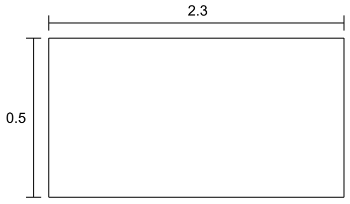
ARCADIS Trial Pit Log

TP104

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **65.76**	Start Date **16/08/2017**	Scale **1:25**
Client **Shepway District Council**	Easting (OS mE) **609988.22**	Northing (OS mN) **136627.81**	End Date **16/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
						TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30)		
0.20	B1									
0.20	D2									
0.20	ES3									
						Soft to firm orangish brown sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		0.30	65.46	
0.50	B4									
0.50	D5									
0.50	ES6									
								(1.10)		
1.00	B7									
1.00	D8									
1.00	ES9									
						Firm light greyish brown sandy CLAY. Sand is fine to medium. Rare pockets of white fine SAND (5x5mm). [HEAD DEPOSITS]		1.40	64.36	
1.50	B10									
1.50	D1									
								(1.40)		
2.20	B2									
2.20	D3									
								2.80	62.96	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.80m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

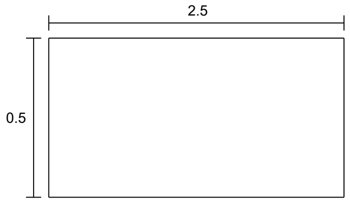
Trial Pit Log

TP105

Project **Otterpool Park**	Project No. **UA008926**	Ground Level (mAOD) **66.65**	Start Date **21/08/2017**	Scale **1:25**
Client **Shepway District Council**	Easting (OS mE) **611195.12**	Northing (OS mN) **137037.36**	End Date **21/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.20 0.20 0.20	B1 D2 ES3					TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30) 0.30	66.35	
0.50 0.50 0.50 1.00 1.00 1.00	B4 D5 ES6 B7 D8 ES9					Soft brown mottled orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is rounded to subangular, fine to medium flint, limestone and sandstone. [ALLUVIUM DEPOSITS]		(1.10) 1.40	65.25	
1.50 1.50	B10 D1					Grey silty fine to medium SAND. [HEAD DEPOSITS]		(0.30) 1.70	64.95	
1.80 1.80	B2 D3					Grey slightly clayey sandy angular to rounded fine to coarse GRAVEL of flint. Sand is fine to coarse. [HEAD DEPOSITS]		(0.30) 2.00	64.65	
2.20 2.20	B4 D5					Grey clayey sandy angular to rounded fine to coarse GRAVEL of flint. Sand is fine to coarse. [HEAD DEPOSITS]		(0.50) 2.50	64.15	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Not stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.50m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

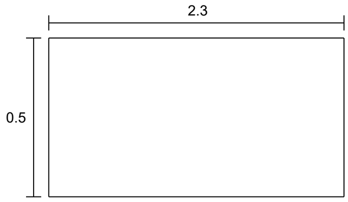
ARCADIS Trial Pit Log

TP106

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**77.41**	**22/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**612677.41**	**136513.96**	**22/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20 0.20 0.20	B1 D2 ES3					TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets. Rare tile and concrete fragments.		(0.30) 0.30	77.11	
0.50 0.50 0.50	B4 D5 ES6					Soft becoming firm light brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to rounded, fine to coarse flint. [HEAD DEPOSITS]		(0.40) 0.70	76.71	
1.00 1.00 1.00 1.50 1.50 2.00 2.00	B7 D8 ES9 B10 D1 B2 D3					Firm orangish brown mottled dark brown sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		(1.80) 2.50	74.91	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.50m

AGS

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

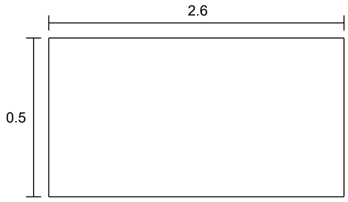
ARCADIS Trial Pit Log

TP107

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**92.67**	**15/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**610704.30**	**136503.22**	**15/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.30 0.30 0.30	B1 D2 ES3					TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.50) 0.50	92.17	
0.60 0.60 0.60 1.00 1.00 1.00 1.60 1.60	B4 D5 ES6 B7 D8 ES9 B10 D1					Soft light brown very sandy CLAY with occasional rootlets. Sand is fine to medium. Occasional pockets of orange SAND (15x20mm). [HEAD DEPOSITS]		(1.20) 1.70	90.97	
2.60 2.60	B2 D3					Soft brown mottled reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse flint. [HEAD DEPOSITS]		(1.00) 2.70	89.97	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:
2.70m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

ARCADIS Trial Pit Log

TP108

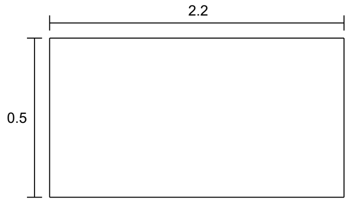
Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**73.04**	**17/08/2017**	**1:25**

Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611770.64**	**136484.47**	**17/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.20	B1				
0.20	D2				
0.20	ES3				
0.60	B4				
0.60	D5				
0.60	ES6				
1.00	B7				
1.00	D8				
1.00	ES9				
1.50	B10				
1.50	D1				

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.40) 0.40	72.64	
Soft orangish brown sandy CLAY. Sand is fine to medium.[ALLUVIUM DEPOSITS]		(0.50) 0.90	72.14	
Soft brown mottled orangish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint. Rare bands of black SAND (10-20mm). [HEAD DEPOSITS]		(0.40) 1.30	71.74	
Soft brown mottled orange and grey slightly gravelly slightly sandy CLAY. Sand is fine to coars. Gravel is angular to rounded, fine to coarse flint. Rare pockets of black SAND (10x15mm). [HEAD DEPOSITS] Limestone boulder (0.60 x 0.50 x 0.30m)		(0.70) 2.00	71.04	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at 2.00m due to refusal on bedrock.

Termination Depth:

2.00m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

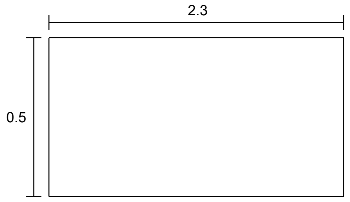
ARCADIS Trial Pit Log

TP109

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**80.25**	**21/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**612231.61**	**136228.20**	**21/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.30 0.30 0.30	B1 D2 ES3					MADE GROUND; Brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint and plastic.	⊠	(0.60) 0.60	79.65	▥
0.70 0.70 0.70	B4 D5 ES6					Soft to firm orangish brown slightly sandy SILT with rare rootlets. Sand is fine. [HEAD DEPOSITS]	×			▥
1.20 1.20 1.20	B7 D8 ES9						×	(1.90)		▥
2.00 2.00	B10 D1						×	2.50	77.75	▥

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.50m

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

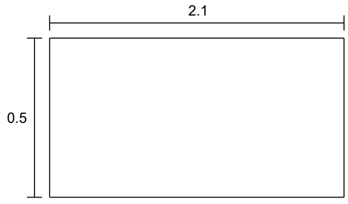
ARCADIS Trial Pit Log

TP110

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**101.14**	**22/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**610956.18**	**136019.59**	**22/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.30 0.30 0.30	B1 D2 ES3					TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.40) 0.40	100.74	
0.60 0.60 0.60 1.00 1.00 1.00	B4 D5 ES6 B7 D8 ES9					Soft becoming firm orangish brown slightly sandy SILT. Sand is fine to coarse. [HEAD DEPOSITS]		(1.20) 1.60	99.54	
1.80 1.80 2.40 2.40	B10 D1 B2 D3					Firm greenish brown sandy CLAY. Sand is fine to coarse. Becoming very sandy with depth. Occasional pockets of light brown and black SAND (10x10mm). [HEAD DEPOSITS]		(0.90) 2.50	98.64	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at scheduled depth.

Termination Depth:

2.50m

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

ARCADIS Trial Pit Log

TP111

Project
Otterpool Park
Client
Shepway District Council

Project No.
UA008926
Easting (OS mE)
611372.01

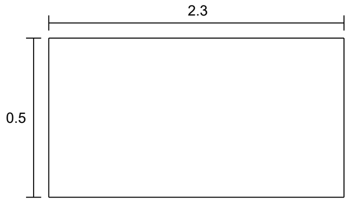
Ground Level (mAOD)
91.43
Northing (OS mN)
136251.04

Start Date
15/08/2017
End Date
15/08/2017

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.30 0.30 0.30	B1 D2 ES3					TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.60) 0.60	90.82	
0.50 0.50 0.50	B4 D5 ES6									
1.00 1.00 1.00	B7 D8 ES9					Soft becoming firm orangish brown sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(1.50)		
1.60 1.60	B10 D1					Cobbles of weathered grey limestone up to 350x250mm		2.10	89.32	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at 2.0m due to refusal on bedrock.

Termination Depth:
2.10m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

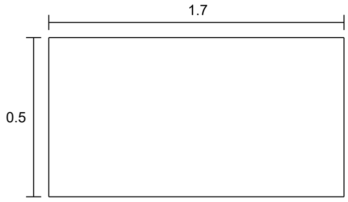
Trial Pit Log

TP111A

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**89.21**	**22/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611403.93**	**136322.45**	**22/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
						TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets. Limestone rockhead encountered at 0.30m.		(0.40) 0.40	88.81	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at 0.40m due to refusal on bedrock.

Termination Depth:

0.40m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

ARCADIS Trial Pit Log

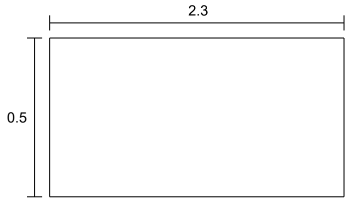
TP112

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**96.44**	**16/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**611665.00**	**135941.12**	**16/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.20 0.20 0.20	B1 D2 ES3				
0.50 0.50 0.50	B4 D5 ES6				
1.00 1.00 1.00	B7 D8 ES9				
1.50 1.50	B10 D1				

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.30) 0.30	96.14	
Yellowish brown slightly clayey sandy GRAVEL with occasional cobbles of limestone. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of limestone. [HEAD DEPOSITS] Limestone boulder (0.50 x 0.25 x 0.40m. Sandstone gravels rounded to subangular fine to coarse.		(1.30) 1.60	94.84	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at 1.60m due to refusal on bedrock.

Termination Depth:

1.60m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Limited**	**HK**	**IP**

ARCADIS Trial Pit Log

TP113

Project
Otterpool Park
Client
Shepway District Council

Project No.
UA008926
Easting (OS mE)
611234.8

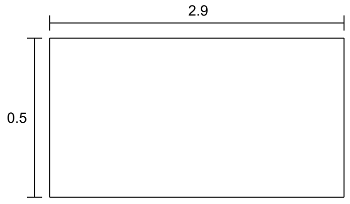
Ground Level (mAOD)
82.66
Northing (OS mN)
136519.5

Start Date
17/08/2017
End Date
17/08/2017

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
						MADE GROUND; Dark grey slightly clayey sandy GRAVEL with rare cobbles of concrete. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint, brick, tarmac and concrete. Hydrocarbon odour noted.	▨	(0.40)		
0.30 0.30 0.30	B1 D2 ES3						▨			
						MADE GROUND; Soft greenish brown slightly gravelly sandy CLAY with rare cobbles of concrete. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint, concrete, slag, tarmac, wood and pipe.	▨	0.40	82.26	
0.60 0.60 0.60	B4 D5 ES6						▨			
1.00 1.00 1.00	B7 D8 ES9						▨			
1.40 1.40 1.40	B10 D1 ES2						▨			
							▨	(2.70)		
2.00 2.00 2.00	B3 D4 ES5						▨			
						Burnt wood pieces and rusted metal up to 200 x 150mm.	▨			
2.50 2.50 2.50	B6 D7 ES8						▨			
3.00 3.00 3.00	B9 D10 ES1					Black tarmac pieces with odour 50x50mm.	▨			
								3.10	79.56	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Groundwater not encountered. 2. Terminated at 3.10m due to refusal.

Termination Depth:
3.10m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Contractor
Arcadis Consulting (UK) Limited

Logged By
HK

Checked By
IP

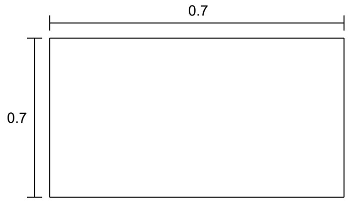
Trial Pit Log

HD101

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**68.09**	**21/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**609688.13**	**136765.08**	**21/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
						TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.25) 0.25	67.84	
0.50 0.50 1.00 1.00	B ES B ES					Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse quartz. [HEAD DEPOSITS]		(0.95) 1.20	66.89	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Hand dug pit. 2. Groundwater not encountered. 3. No visual or olfactory evidence of contamination.

Termination Depth:

1.20m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Hand tools	**Arcadis Consulting (UK) Limited**	**SAS**	**IP**

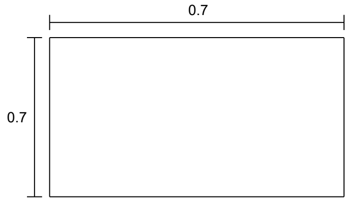
ARCADIS Trial Pit Log

HD102

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Park	**UA008926**	**65.22**	**21/08/2017**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Shepway District Council	**609855.55**	**136667.01**	**21/08/2017**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
						TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.		(0.20) 0.20	65.02	
0.50 0.50 1.00 1.00	B ES B ES					Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse quartz. [HEAD DEPOSITS]		(1.00) 1.20	64.02	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Hand dug pit. 2. Groundwater not encountered. 3. No visual or olfactory evidence of contamination.

Termination Depth:
1.20m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Hand tools	**Arcadis Consulting (UK) Limited**	**SAS**	**IP**

ARCADIS **Trial Pit Log** **HD103**

Project
Otterpool Park
Client
Shepway District Council

Project No.
UA008926
Easting (OS mE)
609754.60

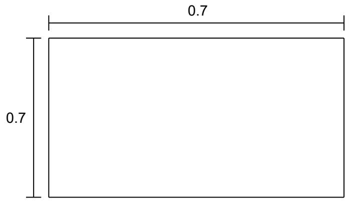
Ground Level (mAOD)
79.01
Northing (OS mN)
136560.71

Start Date
21/08/2017
End Date
21/08/2017

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
						TOPSOIL; Grass over brown slightly gravelly sandy clay with rootlets.	▨	(0.20) 0.20	78.81	▦
0.50 0.50 1.00 1.00	B ES B ES					Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular, fine to coarse quartz. [HEAD DEPOSITS]	▨	(1.00) 1.20	77.81	▦

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

1. Hand dug pit. 2. Groundwater not encountered. 3. No visual or olfactory evidence of contamination.

Termination Depth:
1.20m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
Hand tools

Contractor
Arcadis Consulting (UK) Limited

Logged By
SAS

Checked By
IP

APPENDIX D

CERTIFICATION OF FIELD APPARATUS

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX59JP

SPT Hammer Ref:	AR1704
Test Date:	09/02/2017
Report Date:	24/05/2017
File Name:	AR1704.spt
Test Operator:	SH

Instrumented Rod Data

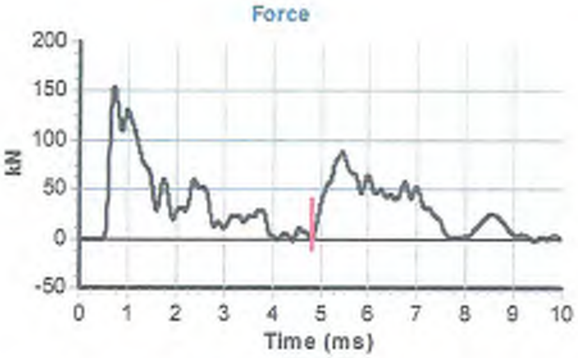
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.1
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	7080
Accelerometer No.2:	7079

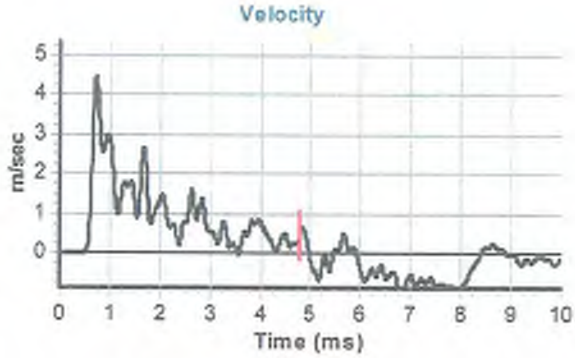
SPT Hammer Information

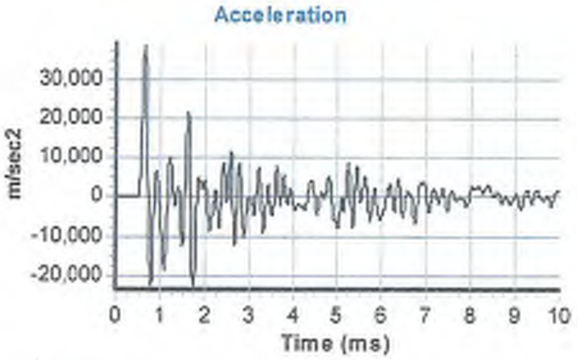
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

Comments / Location

CALIBRATION


Force


Velocity


Acceleration


Displacement

[redacted]

Calculations

Area of Rod A (mm2):	918
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	321

Energy Ratio E_r (%): 68

Signed: S. HOWARTH
Title: FITTER

The recommended calibration interval is 12 months

APPENDIX E

IN SITU AND MONITORING DATA

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS103	31/08/2017 11:43	1007		Peak: 0.0 Steady: 0.0	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.4	0	0	-	5.4	
						10	0.1	2.2	19.6	0	0			
						20	0.1	2.3	18.9	0	0			
						30	0.1	2.3	18.8	0	0			
						40	0.1	2.4	18.6	0	0			
						50	0.1	2.5	18.5	0	0			
						60	0.1	2.6	18.4	0	0			
						90	0.1	2.7	18.3	0	0			
						120	0.1	2.8	18.1	0	0			
						150	0.1	2.9	18.1	0	0			
						180	0.1	2.9	18.1	0	0			
						210	0.1	3.0	17.9	0	0			
						240	0.1	3.3	17.6	0	0			
						270	0.1	3.5	17.4	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.4**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	31/08/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS104	31/08/2017 12:47	1007		Peak: 0.02 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.4	0	0	-	5.4	
						10	0.1	1.5	19.6	0	0			
						20	0.1	1.5	19.5	0	0			
						30	0.1	1.5	19.5	0	0			
						40	0.1	1.5	19.5	0	0			
						50	0.1	1.5	19.5	0	0			
						60	0.1	1.5	19.4	0	0			
						90	0.1	1.6	19.4	0	0			
						120	0.1	1.6	19.4	0	0			
						150	0.1	1.6	19.4	0	0			
						180	0.1	1.6	19.3	0	0			
						210	0.1	1.7	19.3	0	0			
						240	0.1	1.7	19.2	0	0			
						270	0.1	1.8	19.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.4**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	31/08/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS105	31/08/2017 12:17	1007		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.3	0	0	1.18	2.65	
						10	0.1	0.1	21.2	0	0			
						20	0.1	0.1	21.1	0	0			
						30	0.1	0.2	21.0	0	0			
						40	0.1	0.2	21.0	0	0			
						50	0.1	0.2	21.0	0	0			
						60	0.1	0.2	20.9	0	0			
						90	0.1	0.2	20.9	0	0			
						120	0.1	0.2	20.9	0	0			
						150	0.1	0.2	20.9	0	0			
						180	0.1	0.2	20.9	0	0			
						210	0.1	0.2	20.9	0	0			
						240	0.1	0.2	20.9	0	0			
						270	0.1	0.2	20.9	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.3**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	31/08/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS106	31/08/2017 13:38	1010		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.3	0	0	2.31	3.33	
						10	0.1	1.0	20.5	0	0			
						20	0.0	1.1	20.3	0	0			
						30	0.0	1.1	20.3	0	0			
						40	0.0	1.1	20.3	0	0			
						50	0.0	1.1	20.3	0	0			
						60	0.0	1.1	20.3	0	0			
						90	0.0	1.2	20.3	0	0			
						120	0.1	1.2	20.3	0	0			
						150	0.1	1.2	20.2	0	0			
						180	0.0	1.2	20.2	0	0			
						210	0.0	1.2	20.2	0	0			
						240	0.0	1.2	20.2	0	0			
						270	0.0	1.2	20.2	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.3**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS107	31/08/2017 14:30	1010		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.0	0	0	2.14	2.95	
						10	0.0	3.8	16.0	0	0			
						20	0.0	3.9	14.6	0	0			
						30	0.0	4.1	14.3	0	0			
						40	0.0	4.3	14.1	0	0			
						50	0.0	4.5	13.8	0	0			
						60	0.0	4.5	13.6	0	0			
						90	0.0	4.5	13.6	0	0			
						120	0.0	4.6	13.5	0	0			
						150	0.0	4.6	13.5	0	0			
						180	0.0	4.6	13.5	0	0			
						210	0.0	4.6	13.5	0	0			
						240	0.0	4.6	13.4	0	0			
						270	0.0	4.6	13.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.3**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS108	31/08/2017 15:44	1010		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.5	0	0	2.42	2.75	
						10	0.0	1.8	20.2	0	0			
						20	0.0	1.9	19.9	0	0			
						30	0.0	2.1	19.8	0	0			
						40	0.0	2.1	19.7	0	0			
						50	0.0	2.2	19.7	0	0			
						60	0.0	2.2	19.7	0	0			
						90	0.0	2.2	19.7	0	0			
						120	0.0	2.2	19.7	0	0			
						150	0.0	2.2	19.7	0	0			
						180	0.0	2.2	19.6	0	0			
						210	0.0	2.2	19.6	0	0			
						240	0.0	2.2	19.6	0	0			
						270	0.0	2.2	19.6	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.5**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS112	31/08/2017 10:25	1007		Peak: 0.01 Steady: 0.00	Peak: 0.3 Steady: 0.0	0	0.0	0.0	20.6	0	0	-	3.31	
						10	0.0	0.2	20.5	0	0			
						20	0.0	0.9	19.8	0	0			
						30	0.0	1.0	19.7	0	0			
						40	0.0	1.0	19.6	0	0			
						50	0.0	1.0	19.5	0	0			
						60	0.0	1.0	19.5	0	0			
						90	0.0	1.1	19.5	0	0			
						120	0.0	1.1	19.4	0	0			
						150	0.0	1.1	19.3	0	0			
						180	0.1	1.2	19.3	0	0			
						210	0.1	1.2	19.2	0	0			
						240	0.1	1.3	19.0	0	0			
						270	0.1	1.4	18.9	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	31/08/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH101	31/08/2017 10:35	1007		Peak: 0.01 Steady: 0.0	Peak: 0.01 Steady: 0.0	0	0.0	0.0	20.2	0	0	-	9.92	
						10	0.0	0.0	20.0	0	0			
						20	0.0	0.0	20.1	0	0			
						30	0.0	0.0	20.2	0	0			
						40	0.0	0.0	20.1	0	0			
						50	0.0	0.0	20.1	0	0			
						60	0.0	0.0	20.1	0	0			
						90	0.0	0.0	20.1	0	0			
						120	0.0	0.0	20.1	0	0			
						150	0.0	0.0	20.2	0	0			
						180	0.0	0.0	20.2	0	0			
						210	0.0	0.0	20.2	0	0			
						240	0.0	0.0	20.2	0	0			
						270	0.0	0.0	20.2	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH102	31/08/2017 13:18	1010		Peak: 0.01 Steady: 0.0	Peak: 0.01 Steady: 0.0	0	0.0	0.0	21.4	0	0	-	9.56	
						10	0.0	2.5	19.1	0	0			
						20	0.0	2.5	19.1	0	0			
						30	0.0	2.5	19.1	0	0			
						40	0.0	2.5	19.1	0	0			
						50	0.0	2.5	19.1	0	0			
						60	0.0	2.5	19.1	0	0			
						90	0.0	2.5	19.1	0	0			
						120	0.0	2.5	19.1	0	0			
						150	0.0	2.5	19.1	0	0			
						180	0.0	2.5	19.1	0	0			
						210	0.0	2.5	19.1	0	0			
						240	0.0	2.5	19.1	0	0			
						270	0.0	2.5	19.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.4**
H2S	**0**
CO	**0**

ARCADIS

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	31/08/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH103	31/08/2017 14:38	1010		Peak: 0.01 Steady: 0.0	Peak: 0.01 Steady: 0.0	0	0.0	0.0	20.8	0	0	1.87	8.28	
						10	0.1	0.1	20.9	0	0			
						20	0.1	0.2	20.5	0	0			
						30	0.1	0.2	20.4	0	0			
						40	0.0	0.2	20.4	0	0			
						50	0.0	0.2	20.3	0	0			
						60	0.0	0.2	20.3	0	0			
						90	0.0	0.2	20.2	0	0			
						120	0.0	0.2	20.2	0	0			
						150	0.0	0.2	20.1	0	0			
						180	0.0	0.2	20.1	0	0			
						210	0.0	0.2	20.0	0	0			
						240	0.0	0.2	20.0	0	0			
						270	0.0	0.2	20.0	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.8**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	Date:	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH104	31/08/2017 11:00	1010		Peak: 0.0 Steady: 0.0	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.2	0	0	3.81	7.88	
						10	0.0	0.4	19.8	2	0			
						20	0.0	0.4	19.7	2	0			
						30	0.0	0.4	19.4	2	0			
						40	0.0	0.4	19.3	3	0			
						50	0.0	0.4	19.2	2	0			
						60	0.0	0.4	19.1	3	0			
						90	0.0	0.4	19.1	3	0			
						120	0.0	0.5	19.1	2	0			
						150	0.0	0.5	19.1	2	0			
						180	0.0	0.5	19.0	3	0			
						210	0.0	0.5	19.0	2	0			
						240	0.0	0.5	19.0	3	0			
						270	0.0	0.5	19.0	3	0			

Notes:

Ambient Concentration	
CH4	0
CO2	0
O2	20.2
H2S	0
CO	0

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	31/08/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH105	31/08/2017 15:17	1009		Peak: 0.4 Steady: 0.4	Peak: 0.6 Steady: 0.6	0	0.0	0.1	21.5	0	0	3.69	7.27	
						10	0.0	0.3	18.8	0	0			
						20	0.0	1.2	14.4	3	0			
						30	0.0	1.3	13.2	4	0			
						40	0.0	1.4	12.5	5	0			
						50	0.0	1.4	12.0	6	0			
						60	0.0	1.5	11.6	7	0			
						90	0.0	1.5	11.1	7	0			
						120	0.0	1.6	10.4	8	0			
						150	0.0	1.7	9.6	9	0			
						180	0.0	1.9	8.0	10	0			
						210	0.0	2.3	5.3	13	0			
						240	0.0	2.4	3.9	14	0			
						270	0.0	2.5	3.4	15	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.2**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS103	08/09/2017 11:40	992		Peak: 0.0 Steady: 0.0	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.1	0	0	-	4.96	
						10	0.0	0.6	20.0	0	0			
						20	0.0	4.2	17.1	0	0			
						30	0.0	4.3	16.4	0	0			
						40	0.0	4.4	16.2	0	0			
						50	0.0	4.4	16.1	0	0			
						60	0.0	4.4	16.1	0	0			
						90	0.0	4.4	16.1	0	0			
						120	0.0	4.4	16.1	0	0			
						150	0.0	4.4	16.1	0	0			
						180	0.0	4.4	16.1	0	0			
						210	0.0	4.4	16.1	0	0			
						240	0.0	4.4	16.1	0	0			
						270	0.0	4.4	16.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.1**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS104	08/09/2017 12:50	992		Peak: 0.02 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.8	0	0	-	3.77	
						10	0.0	1.9	18.2	0	0			
						20	0.0	2.8	16.8	0	0			
						30	0.0	2.9	16.4	0	0			
						40	0.0	2.9	16.3	0	0			
						50	0.0	2.9	16.3	0	0			
						60	0.0	2.9	16.3	0	0			
						90	0.0	2.9	16.3	0	0			
						120	0.0	2.9	16.3	0	0			
						150	0.0	2.9	16.3	0	0			
						180	0.0	2.9	16.3	0	0			
						210	0.0	2.9	16.3	0	0			
						240	0.0	2.9	16.3	0	0			
						270	0.0	2.9	16.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.8**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS105	08/09/2017 12:32	994		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.8	0	0	0.942	2.65	
						10	0.0	0.1	20.8	0	0			
						20	0.0	0.2	20.4	0	0			
						30	0.0	0.2	20.3	0	0			
						40	0.0	0.2	20.3	0	0			
						50	0.0	0.2	20.3	0	0			
						60	0.0	0.2	20.3	0	0			
						90	0.0	0.2	20.3	0	0			
						120	0.0	0.2	20.3	0	0			
						150	0.0	0.2	20.3	0	0			
						180	0.0	0.2	20.3	0	0			
						210	0.0	0.2	20.3	0	0			
						240	0.0	0.2	20.3	0	0			
						270	0.0	0.2	20.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.8**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS106	08/09/2017 13:50	992		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.0	0	0	1.99	2.99	
						10	0.1	0.6	20.6	0	0			
						20	0.0	0.7	20.4	0	0			
						30	0.0	0.9	20.3	0	0			
						40	0.0	1.0	20.3	0	0			
						50	0.0	1.1	20.2	0	0			
						60	0.0	1.1	20.1	0	0			
						90	0.0	1.2	20.0	0	0			
						120	0.0	1.2	20.0	0	0			
						150	0.0	1.3	19.9	0	0			
						180	0.0	1.3	19.9	0	0			
						210	0.0	1.4	19.9	0	0			
						240	0.0	1.4	19.8	0	0			
						270	0.0	1.4	19.8	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.0**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS107	08/09/2017 14:30	992		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.6	0	0	2.28	3.03	
						10	0.0	0.2	20.5	0	0			
						20	0.0	0.9	19.7	0	0			
						30	0.0	1.1	18.9	0	0			
						40	0.0	1.4	18.5	0	0			
						50	0.0	1.7	17.6	0	0			
						60	0.0	2.0	16.4	0	0			
						90	0.0	2.3	16.1	0	0			
						120	0.0	2.4	15.9	0	0			
						150	0.0	2.7	15.1	0	0			
						180	0.0	2.9	15.5	0	0			
						210	0.0	3.1	15.4	0	0			
						240	0.0	3.4	15.4	0	0			
						270	0.0	3.5	15.4	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS108	08/09/2017 16:00	995				0	0.0	0.0	20.7	0	0	2.672	2.72	
						10	0.0	0.1	20.7	0	0			
				Peak: 0.01	Peak: 0.0	20	0.0	0.1	20.7	0	0			
						30	0.0	0.1	20.7	0	0			
						40	0.0	0.1	20.7	0	0			
						50	0.0	0.1	20.7	0	0			
						60	0.0	0.1	20.7	0	0			
						90	0.0	0.1	20.7	0	0			
						120	0.0	0.2	20.7	0	0			
				Steady: 0.01	Steady: 0.0	150	0.0	0.2	20.7	0	0			
						180	0.0	0.3	20.7	0	0			
						210	0.0	0.3	20.7	0	0			
						240	0.0	0.4	20.6	0	0			
						270	0.0	0.4	20.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.7**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	Date:	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS112	08/09/2017 10:12	991		Peak: 0.01 Steady: 0.00	Peak: 0.3 Steady: 0.0	0	0.0	0.0	20.5	0	0	-	3.41	
						10	0.0	0.0	20.4	0	0			
						20	0.0	0.0	20.4	0	0			
						30	0.0	0.0	20.4	0	0			
						40	0.0	0.0	20.4	0	0			
						50	0.0	0.0	20.4	0	0			
						60	0.0	0.0	20.4	0	0			
						90	0.0	0.0	20.4	0	0			
						120	0.0	0.0	20.4	0	0			
						150	0.0	0.0	20.4	0	0			
						180	0.0	0.0	20.4	0	0			
						210	0.0	0.0	20.4	0	0			
						240	0.0	0.0	20.4	0	0			
						270	0.0	0.0	20.4	0	0			

Notes:

Ambient Concentration	
CH4	0
CO2	0
O2	20.5
H2S	0
CO	0

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH101	08/09/2017 10:00	989				0	0.0	0.0	20.5	0	0	9.885	9.92	
						10	0.0	1.0	20.0	0	0			
				Peak: 0.00	Peak: 0.0	20	0.0	1.3	19.3	0	0			
						30	0.0	1.4	19.3	0	0			
						40	0.0	1.4	19.3	0	0			
						50	0.0	1.4	19.3	0	0			
						60	0.0	1.4	19.3	0	0			
						90	0.0	1.4	19.3	0	0			
						120	0.0	1.4	19.3	0	0			
				Steady: 0.00	Steady: 0.0	150	0.0	1.4	19.3	0	0			
						180	0.0	1.4	19.3	0	0			
						210	0.0	1.4	19.3	0	0			
						240	0.0	1.4	19.3	0	0			
						270	0.0	1.4	19.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH102	08/09/2017 10:32	989		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.6	0	0	-	9.56	
						10	0.0	1.7	19.6	0	0			
						20	0.0	2.1	19.1	0	0			
						30	0.0	2.2	18.9	0	0			
						40	0.0	2.3	18.7	0	0			
						50	0.0	2.5	18.6	0	0			
						60	0.0	2.5	18.6	0	0			
						90	0.0	2.6	18.5	0	0			
						120	0.0	2.7	18.5	0	0			
						150	0.0	2.7	18.4	0	0			
						180	0.0	2.7	18.4	0	0			
						210	0.0	2.7	18.4	0	0			
						240	0.0	2.7	18.4	0	0			
						270	0.0	2.7	18.4	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH103	08/09/2017 14:38	992		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.5	0	0	1.84	8.24	
						10	0.0	0.1	20.5	0	0			
						20	0.0	0.2	19.6	0	0			
						30	0.0	0.2	18.8	0	0			
						40	0.0	0.2	18.6	0	0			
						50	0.0	0.2	18.6	0	0			
						60	0.0	0.2	18.4	0	0			
						90	0.0	0.2	18.4	0	0			
						120	0.0	0.2	18.4	0	0			
						150	0.0	0.2	18.2	0	0			
						180	0.0	0.2	18.1	0	0			
						210	0.0	0.2	17.8	0	0			
						240	0.0	0.2	16.8	0	0			
						270	0.0	0.3	16.7	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH104	08/09/2017 11:00	991		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.9	0	0	3.47	7.2	
						10	0.0	1.5	19.6	0	0			
						20	0.0	1.5	18.7	0	0			
						30	0.0	1.5	18.5	0	0			
						40	0.0	1.5	18.5	0	0			
						50	0.0	1.5	18.5	0	0			
						60	0.0	1.5	18.5	0	0			
						90	0.0	1.5	18.5	0	0			
						120	0.0	1.5	18.5	0	0			
						150	0.0	1.5	18.5	0	0			
						180	0.0	1.5	18.5	0	0			
						210	0.0	1.5	18.5	0	0			
						240	0.0	1.5	18.5	0	0			
						270	0.0	1.5	18.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.9**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH105	08/09/2017 15:00	992		Peak: -0.02 Steady: -0.02	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.8	0	0	3.655	7.32	
						10	0.0	1.9	19.2	0	0			
						20	0.0	2.6	18.5	0	0			
						30	0.0	2.6	18.4	0	0			
						40	0.0	2.6	18.4	0	0			
						50	0.0	2.7	18.3	0	0			
						60	0.0	2.7	18.3	0	0			
						90	0.0	2.7	18.3	0	0			
						120	0.0	2.7	18.3	0	0			
						150	0.0	2.7	18.3	0	0			
						180	0.0	2.7	18.3	0	0			
						210	0.0	2.7	18.3	0	0			
						240	0.0	2.7	18.3	0	0			
						270	0.0	2.7	18.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.8**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH1	08/09/2017 10:30	991		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.9	0	0	9.4	12.36	
						10	0.0	2.6	19.8	0	0			
						20	0.0	3.2	18.9	0	0			
						30	0.0	3.4	18.5	0	0			
						40	0.0	3.5	18.6	0	0			
						50	0.0	3.7	18.2	0	0			
						60	0.0	3.9	18.1	0	0			
						90	0.0	3.9	18.0	0	0			
						120	0.0	3.9	18.0	0	0			
						150	0.0	4.0	17.9	0	0			
						180	0.0	4.0	17.9	0	0			
						210	0.0	4.0	17.9	0	0			
						240	0.0	4.0	17.9	0	0			
						270	0.0	4.0	17.9	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.9**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2	08/09/2017 10:45	991		Peak: 0.01 Steady: 0.01	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.9	0	0	7.07	10.56	
						10	0.0	0.0	20.9	0	0			
						20	0.0	2.2	19.5	0	0			
						30	0.0	3.5	17.7	0	0			
						40	0.0	3.5	17.4	0	0			
						50	0.0	3.5	17.3	0	0			
						60	0.0	3.5	17.3	0	0			
						90	0.0	3.5	17.3	0	0			
						120	0.0	3.5	17.2	0	0			
						150	0.0	3.5	17.2	0	0			
						180	0.0	3.5	17.2	0	0			
						210	0.0	3.5	17.2	0	0			
						240	0.0	3.5	17.2	0	0			
						270	0.0	3.5	17.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.9**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**				**Weather:**	**Dry**
Job Number:	**UA008926**	**Date:**	08/09/2017		**Engineer:**	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH3	08/09/2017 11:00	990		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.6	0	0	-	12.87	
						10	0.0	0.4	19.2	0	0			
						20	0.0	1.7	16.6	0	0			
						30	0.0	1.7	16.1	0	0			
						40	0.0	1.7	16.1	0	0			
						50	0.0	1.7	16.1	0	0			
						60	0.0	1.7	16.1	0	0			
						90	0.0	1.7	16.1	0	0			
						120	0.0	1.7	16.1	0	0			
						150	0.0	1.7	16.1	0	0			
						180	0.0	1.7	16.1	0	0			
						210	0.0	1.7	16.1	0	0			
						240	0.0	1.7	16.1	0	0			
						270	0.0	1.7	16.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH4	08/09/2017 11:15	993		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.7	0	0	10.205	10.845	
						10	0.0	2.3	17.2	0	0			
						20	0.0	2.7	15.3	0	0			
						30	0.0	2.9	14.9	0	0			
						40	0.0	3.1	14.4	0	0			
						50	0.0	3.2	14.2	0	0			
						60	0.0	3.2	14.1	0	0			
						90	0.0	3.3	14.0	0	0			
						120	0.0	3.3	14.0	0	0			
						150	0.0	3.3	13.9	0	0			
						180	0.0	3.3	13.8	0	0			
						210	0.0	3.4	13.8	0	0			
						240	0.0	3.4	13.8	0	0			
						270	0.0	3.4	13.7	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.7**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH5	08/09/2017 11:30	991		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.8	0	0	9.73	12.44	
						10	0.0	0.6	19.5	0	0			
						20	0.0	4.1	16.6	0	0			
						30	0.0	4.4	15.9	0	0			
						40	0.0	4.4	15.8	0	0			
						50	0.0	4.4	15.7	0	0			
						60	0.0	4.4	15.7	0	0			
						90	0.0	4.4	15.7	0	0			
						120	0.0	4.4	15.7	0	0			
						150	0.0	4.4	15.7	0	0			
						180	0.0	4.4	15.7	0	0			
						210	0.0	4.4	15.7	0	0			
						240	0.0	4.4	15.7	0	0			
						270	0.0	4.4	13.7	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.8**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH6	08/09/2017 11:40	990		Peak: 0.02 Steady: 0.02	Peak: 0.1 Steady: 0.1	0	0.0	0.0	20.5	0	0	11.39	12.91	
						10	0.0	2.4	18.7	0	0			
						20	0.0	3.6	16.5	0	0			
						30	0.0	3.7	16.1	0	0			
						40	0.0	3.7	16.0	0	0			
						50	0.0	3.7	15.9	0	0			
						60	0.0	3.7	15.9	0	0			
						90	0.0	3.8	15.8	0	0			
						120	0.0	3.8	15.8	0	0			
						150	0.0	3.8	15.8	0	0			
						180	0.0	3.8	15.8	0	0			
						210	0.0	3.8	15.8	0	0			
						240	0.0	3.8	15.8	0	0			
						270	0.0	3.8	15.7	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	08/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH7	08/09/2017 11:50	990		Peak: 0.05 Steady: 0.05	Peak: 0.1 Steady: 0.0	0	0.0	0.0	20.7	0	0	-	12.77	
						10	0.0	3.8	15.5	0	0			
						20	0.0	4.0	14.8	0	0			
						30	0.0	4.0	14.6	0	0			
						40	0.0	4.0	14.5	0	0			
						50	0.0	4.0	14.5	0	0			
						60	0.0	4.0	14.5	0	0			
						90	0.0	4.0	14.5	0	0			
						120	0.0	4.0	14.5	0	0			
						150	0.0	4.0	14.5	0	0			
						180	0.0	4.0	14.5	0	0			
						210	0.0	4.0	14.5	0	0			
						240	0.0	4.0	14.5	0	0			
						270	0.0	4.0	14.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.7**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH8	08/09/2017 12:00	990		Peak: 0.05 Steady: 0.05	Peak: 0.1 Steady: 0.0	0	0.0	0.0	20.6	0	0	-	12.72	
						10	0.0	0.3	20.4	0	0			
						20	0.0	1.6	19.7	0	0			
						30	0.0	1.7	19.5	0	0			
						40	0.0	1.7	19.5	0	0			
						50	0.0	1.7	19.4	0	0			
						60	0.0	1.8	19.4	0	0			
						90	0.0	1.8	19.4	0	0			
						120	0.0	1.8	19.4	0	0			
						150	0.0	1.9	19.3	0	0			
						180	0.0	1.9	19.3	0	0			
						210	0.0	1.9	19.3	0	0			
						240	0.0	2.0	19.3	0	0			
						270	0.0	2.0	19.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH9	08/09/2017 12:10	990		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.6	0	0	11.24	12.65	
						10	0.0	2.1	19.5	0	0			
						20	0.0	2.5	17.9	0	0			
						30	0.0	2.5	17.6	0	0			
						40	0.0	2.5	17.5	0	0			
						50	0.0	2.5	17.4	0	0			
						60	0.0	2.5	17.4	0	0			
						90	0.0	2.5	17.4	0	0			
						120	0.0	2.6	17.4	0	0			
						150	0.0	2.6	17.4	0	0			
						180	0.0	2.6	17.3	0	0			
						210	0.0	2.6	17.3	0	0			
						240	0.0	2.6	17.3	0	0			
						270	0.0	2.6	17.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	08/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH10	08/09/2017 12:20	990		Peak: 0.07 Steady: 0.07	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.5	0	0	-	12.7	
						10	0.0	1.2	19.6	0	0			
						20	0.0	1.4	18.9	0	0			
						30	0.0	1.4	18.8	0	0			
						40	0.0	1.5	18.7	0	0			
						50	0.0	1.5	18.6	0	0			
						60	0.0	1.5	18.6	0	0			
						90	0.0	1.5	18.6	0	0			
						120	0.0	1.5	18.6	0	0			
						150	0.0	1.5	18.6	0	0			
						180	0.0	1.5	18.6	0	0			
						210	0.0	1.5	18.6	0	0			
						240	0.0	1.5	18.6	0	0			
						270	0.0	1.5	18.6	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	15/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS103	15/09/2017 12:30	999		Peak: 0.0 Steady: 0.0	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.1	0	0	-	4.955	
						10	0.0	0.6	18.9	0	0			
						20	0.0	4.3	17.3	0	0			
						30	0.0	4.4	16.8	0	0			
						40	0.0	4.5	16.6	0	0			
						50	0.0	4.5	16.6	0	0			
						60	0.0	4.5	16.5	0	0			
						90	0.0	4.5	16.5	0	0			
						120	0.0	4.5	16.5	0	0			
						150	0.0	4.5	16.5	0	0			
						180	0.0	4.5	16.5	0	0			
						210	0.0	4.5	16.5	0	0			
						240	0.0	4.5	16.5	0	0			
						270	0.0	4.5	16.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.1**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	15/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS104	15/09/2017 14:00	1000		Peak: 0.01 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	21.0	0	0	-	3.77	
						10	0.0	1.6	19.1	0	0			
						20	0.0	2.4	18.1	0	0			
						30	0.0	2.4	17.7	0	0			
						40	0.0	2.4	17.6	0	0			
						50	0.0	2.4	17.6	0	0			
						60	0.0	2.4	17.6	0	0			
						90	0.0	2.4	17.6	0	0			
						120	0.0	2.4	17.6	0	0			
						150	0.0	2.4	17.6	0	0			
						180	0.0	2.4	17.6	0	0			
						210	0.0	2.4	17.6	0	0			
						240	0.0	2.4	17.6	0	0			
						270	0.0	2.4	17.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**21.0**
H2S	**0**
CO	**0**

ARCADIS

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	15/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS105	15/09/2017 11:36	1001		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.5	0	0	0.931	2.65	
						10	0.0	0.4	21.0	0	0			
						20	0.0	2.1	19.2	0	0			
						30	0.0	2.2	18.8	0	0			
						40	0.0	2.2	18.7	0	0			
						50	0.0	2.2	18.6	0	0			
						60	0.0	2.2	18.6	0	0			
						90	0.0	2.2	18.6	0	0			
						120	0.0	2.2	18.6	0	0			
						150	0.0	2.2	18.6	0	0			
						180	0.0	2.2	18.6	0	0			
						210	0.0	2.2	18.6	0	0			
						240	0.0	2.2	18.6	0	0			
						270	0.0	2.2	18.6	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	15/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS106	15/09/2017 13:50	1000		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.4	0	0	1.935	2.98	
						10	0.0	0.7	20.0	0	0			
						20	0.0	1.7	19.6	0	0			
						30	0.0	1.8	19.3	0	0			
						40	0.0	1.9	19.3	0	0			
						50	0.0	2.0	19.2	0	0			
						60	0.0	2.0	19.2	0	0			
						90	0.0	2.0	19.1	0	0			
						120	0.0	2.0	19.1	0	0			
						150	0.1	2.1	19.1	0	0			
						180	0.1	2.1	19.1	0	0			
						210	0.1	2.1	19.1	0	0			
						240	0.1	2.1	19.1	0	0			
						270	0.1	2.1	19.1	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.4**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	15/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS107	15/09/2017 10:30	1000		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.5	0	0	2.235	3	
						10	0.0	2.7	19.0	0	0			
						20	0.0	4.4	15.7	0	0			
						30	0.0	4.5	14.3	0	0			
						40	0.0	4.6	13.6	0	0			
						50	0.0	4.6	13.3	0	0			
						60	0.0	4.7	13.1	0	0			
						90	0.0	4.7	13.0	0	0			
						120	0.0	4.7	13.0	0	0			
						150	0.0	4.7	12.9	0	0			
						180	0.0	4.7	12.9	0	0			
						210	0.0	4.7	12.9	0	0			
						240	0.0	4.7	12.9	0	0			
						270	0.0	4.7	12.8	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	15/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
WS108	15/09/2017 16:00	1001		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.8	0	0	2.572	2.7	
						10	0.0	1.2	20.6	0	0			
						20	0.0	1.7	19.9	0	0			
						30	0.0	1.8	19.6	0	0			
						40	0.0	1.8	19.4	0	0			
						50	0.0	1.8	19.4	0	0			
						60	0.0	1.8	19.4	0	0			
						90	0.0	1.8	19.4	0	0			
						120	0.0	1.8	19.4	0	0			
						150	0.0	1.8	19.4	0	0			
						180	0.0	1.8	19.3	0	0			
						210	0.0	1.8	19.3	0	0			
						240	0.0	1.8	19.3	0	0			
						270	0.0	1.8	19.3	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.8**
H2S	**0**
CO	**0**

ARCADIS

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	15/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
WS112	15/09/2017 12:12	1001		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.9	0	0	-	3.696	
						10	0.0	0.3	20.3	0	0			
						20	0.0	0.7	19.9	0	0			
						30	0.0	0.7	19.8	0	0			
						40	0.0	0.7	19.8	0	0			
						50	0.0	0.7	19.8	0	0			
						60	0.0	0.7	19.8	0	0			
						90	0.0	0.7	19.8	0	0			
						120	0.0	0.7	19.8	0	0			
						150	0.0	0.7	19.8	0	0			
						180	0.0	0.7	19.8	0	0			
						210	0.0	0.7	19.8	0	0			
						240	0.0	0.7	19.8	0	0			
						270	0.0	0.7	19.8	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.9**
H2S	**0**
CO	**0**

ARCADIS

Project:	Otterpool Park			**Weather:**	Dry
Job Number:	UA008926	**Date:**	15/09/2017	**Engineer:**	Roy Dennis

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH101	15/09/2017 12:03	1001		Peak: 0.01 Steady: 0.01	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.9	0	0	10.13	10.18	Not true groundwater in well. This is leftover water in the well endcap from infiltrating testing
						10	0.0	0.3	20.8	0	0			
						20	0.0	0.6	20.5	0	0			
						30	0.0	0.6	20.5	0	0			
						40	0.0	0.6	20.5	0	0			
						50	0.0	0.6	20.5	0	0			
						60	0.0	0.6	20.5	0	0			
						90	0.0	0.6	20.5	0	0			
						120	0.0	0.6	20.5	0	0			
						150	0.0	0.6	20.5	0	0			
						180	0.0	0.6	20.5	0	0			
						210	0.0	0.6	20.5	0	0			
						240	0.0	0.6	20.5	0	0			
						270	0.0	0.6	20.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.9**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**		
Job Number:	**UA008926**	**Date:**	15/09/2017

Weather:	**Dry**
Engineer:	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°C)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH102	15/09/2017 11:51	1001		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.6	0	0	-	9.59	
						10	0.0	0.1	20.5	0	0			
						20	0.0	2.6	19.4	0	0			
						30	0.0	2.8	18.7	0	0			
						40	0.0	2.8	18.5	0	0			
						50	0.0	2.8	18.5	0	0			
						60	0.0	2.8	18.4	0	0			
						90	0.0	2.8	18.5	0	0			
						120	0.0	2.8	18.5	0	0			
						150	0.0	2.8	18.4	0	0			
						180	0.0	2.8	18.4	0	0			
						210	0.0	2.8	18.4	0	0			
						240	0.0	2.8	18.5	0	0			
						270	0.0	2.8	18.5	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

Project:	**Otterpool Park**			**Weather:**	**Dry**
Job Number:	**UA008926**	**Date:**	15/09/2017	**Engineer:**	**Roy Dennis**

Monitoring Point Reference	**Date/ Time**	**Atmos. Pressure (mbar)**	**Temp. (°c)**	**Well Pressure (mbar)**	**Flow Rate (l/h)**	**Time (sec)**	**CH4 (% v/v)**	**CO2 (% v/v)**	**O2 (% v/v)**	**CO (ppm)**	**H2S (ppm)**	**Depth to Water (m)**	**Depth to base (m)**	**Comments** (all readings from GL, note datum height if different)
BH103	15/09/2017 12:00	1000		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.2	0	0	1.477	8.24	
						10	0.0	0.0	20.1	0	0			
						20	0.0	0.1	20.0	0	0			
						30	0.0	0.1	19.9	0	0			
						40	0.0	0.1	19.8	0	0			
						50	0.0	0.1	19.8	0	0			
						60	0.0	0.1	19.8	0	0			
						90	0.0	0.1	19.8	0	0			
						120	0.0	0.2	19.7	0	0			
						150	0.0	0.2	19.7	0	0			
						180	0.0	0.2	19.6	0	0			
						210	0.0	0.2	19.6	0	0			
						240	0.0	0.2	19.6	0	0			
						270	0.0	0.2	19.6	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.5**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	**Date:**	15/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH104	15/09/2017 14:30	1000		Peak: 0.00 Steady: 0.00	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.6	0	0	3.474	6.45	
						10	0.1	1.6	18.7	0	0			
						20	0.1	1.6	17.9	0	0			
						30	0.1	1.6	17.8	0	0			
						40	0.0	1.6	17.8	0	0			
						50	0.0	1.6	17.8	0	0			
						60	0.0	1.6	17.8	0	0			
						90	0.0	1.6	17.8	0	0			
						120	0.0	1.6	17.8	0	0			
						150	0.0	1.6	17.7	0	0			
						180	0.0	1.6	17.7	0	0			
						210	0.0	1.6	17.7	0	0			
						240	0.0	1.6	17.7	0	0			
						270	0.0	1.6	17.7	0	0			

Notes:

Ambient Concentration	
CH4	**0**
CO2	**0**
O2	**20.6**
H2S	**0**
CO	**0**

Project:	Otterpool Park		
Job Number:	UA008926	Date:	15/09/2017

Weather:	Dry
Engineer:	Roy Dennis

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°c)	Well Pressure (mbar)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH105	15/09/2017 11:22	1001		Peak: -0.02 Steady: -0.02	Peak: 0.0 Steady: 0.0	0	0.0	0.0	20.8	0	0	3.378	7.31	
						10	0.0	0.4	19.8	0	0			
						20	0.0	2.7	18.1	0	0			
						30	0.0	3.0	17.3	0	0			
						40	0.0	3.3	16.8	0	0			
						50	0.0	3.5	16.4	0	0			
						60	0.0	3.6	16.0	0	0			
						90	0.0	3.8	14.7	0	0			
						120	0.0	3.9	15.6	0	0			
						150	0.0	3.9	15.5	0	0			
						180	0.0	3.9	15.4	0	0			
						210	0.0	4.0	15.4	0	0			
						240	0.0	4.0	15.3	0	0			
						270	0.0	4.0	15.3	0	0			

Notes:

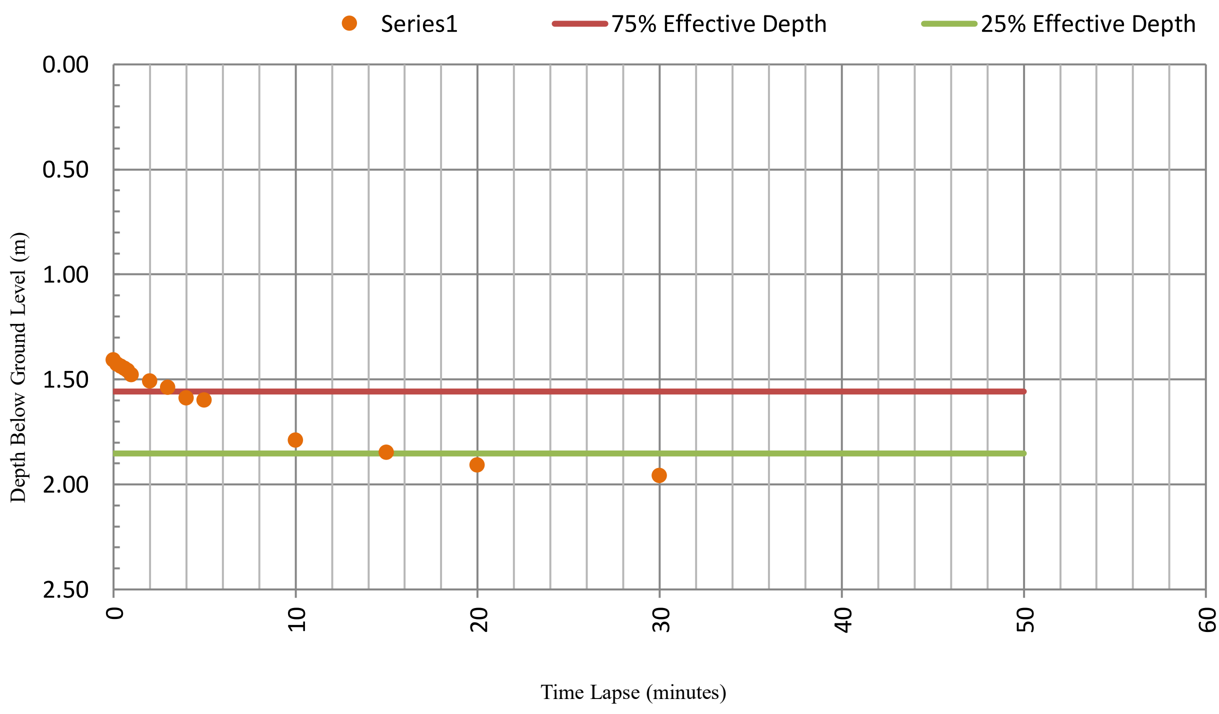
Ambient Concentration	
CH4	0
CO2	0
O2	20.8
H2S	0
CO	0

SOAKAWAY INFILTRATION TEST

Project				Trial Pit No
Otterpool Park				**TP101**
Job No. UA008926	Date 15/08/2017	Ground Level (mAOD) 71.59	Co-Ordinates E 610259.33 N 137376.17	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.30	Length	2.70
Width	0.50	Width	0.50
Depth	2.00	Depth	2.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.41		
0.2	1.43		
0.4	1.44		
0.6	1.45		
0.8	1.46		
1	1.48		
2	1.51		
3	1.54		
4	1.59		
5	1.60		
10	1.79		
15	1.85		
20	1.91		
30	1.96		
50	Dry		



Infiltration Rate = 1.44 x 10^{-4} m/s

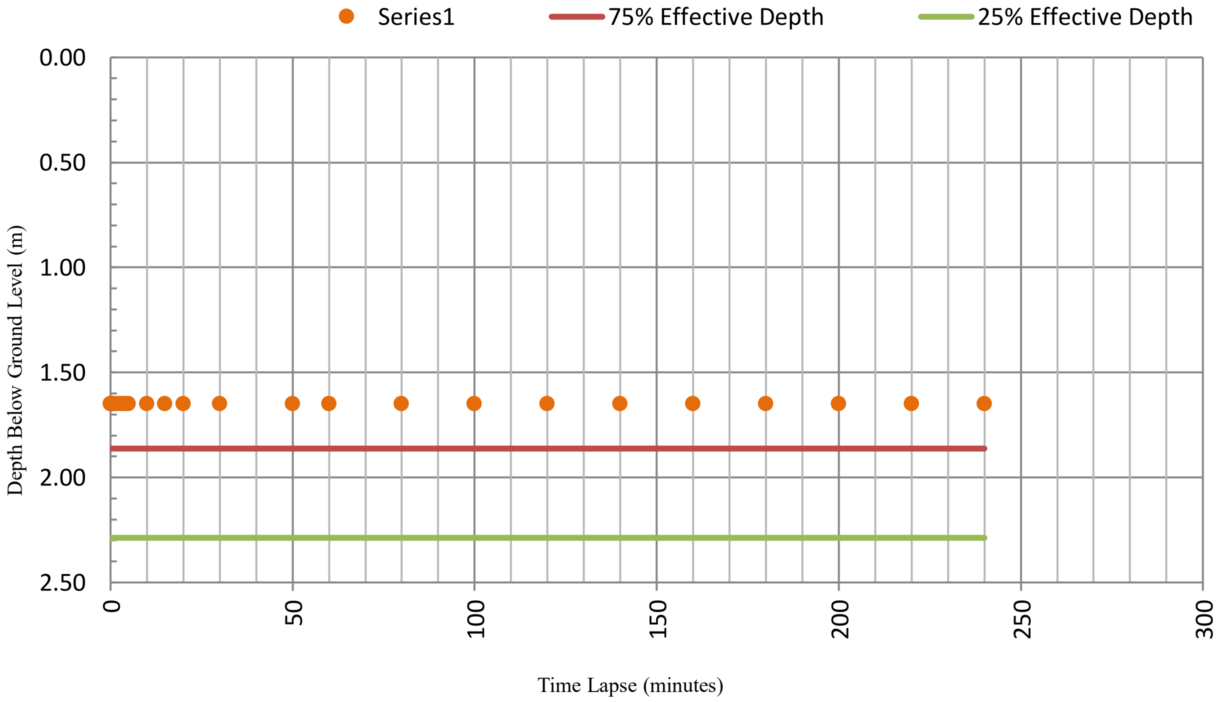
All dimensions in metres, sides collasped so second test could not be undertaken.	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP102**
Job No. UA008926	Date 14/08/2017	Ground Level (mAOD)	Co-Ordinates	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.70	Length	2.70
Width	0.50	Width	0.50
Depth	2.50	Depth	2.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.65	80	1.65
0.2	1.65	100	1.65
0.4	1.65	120	1.65
0.6	1.65	140	1.65
0.8	1.65	160	1.65
1	1.65	180	1.65
2	1.65	200	1.65
3	1.65	220	1.65
4	1.65	240	1.65
5	1.65		
10	1.65		
15	1.65		
20	1.65		
30	1.65		
50	1.65		
60	1.65		



Infiltration Rate = cannot be calculated due to lack of soakage

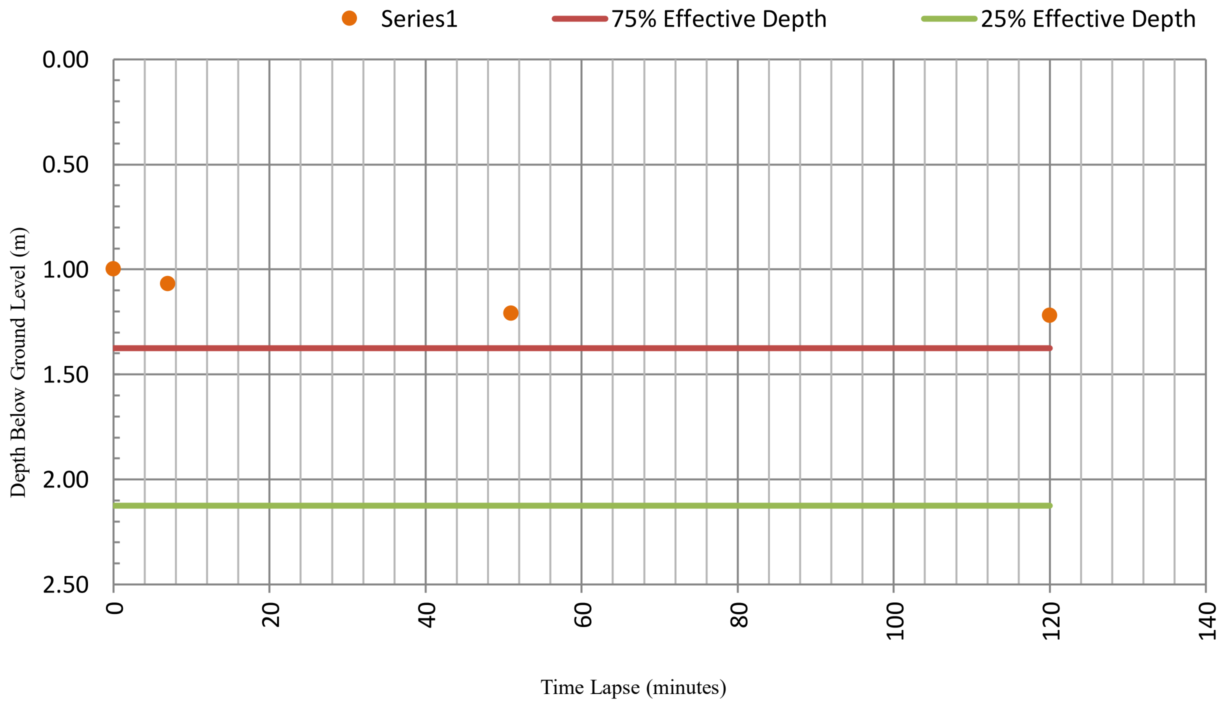
All dimensions in metres	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP103**
Job No. UA008926	Date 14/08/2017	Ground Level (mAOD) 79.732	Co-Ordinates E613536.69 W136951.58	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.90	Length	2.90
Width	0.40	Width	2.40
Depth	2.50	Depth	2.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.00		
7	1.07		
51	1.21		
120	1.22		



Infiltration Rate = cannot be calculated due to lack of soakage

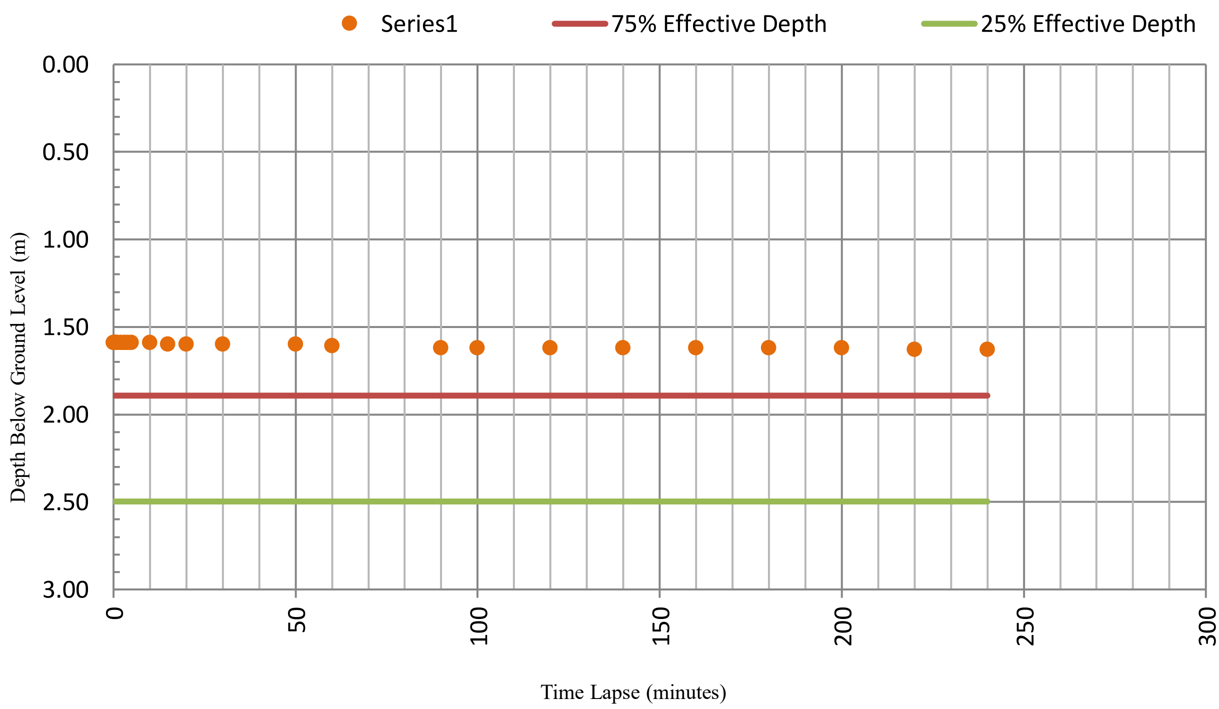
All dimensions in metres	Client Shepway District Council	Logged By LK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP104**
Job No. UA008926	Date 16/08/2017	Ground Level (mAOD) 65.76	Co-Ordinates E609988.22 W136627.81	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.30	Length	2.20
Width	0.50	Width	0.50
Depth	2.80	Depth	2.70

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.59	90	1.62
0.2	1.59	100	1.62
0.4	1.59	120	1.62
0.6	1.59	140	1.62
0.8	1.59	160	1.62
1	1.59	180	1.62
2	1.59	200	1.62
3	1.59	220	1.63
4	1.59	240	1.63
5	1.59		
10	1.59		
15	1.60		
20	1.60		
30	1.60		
50	1.60		
60	1.61		



Infiltration Rate = cannot be calculated due to lack of soakage

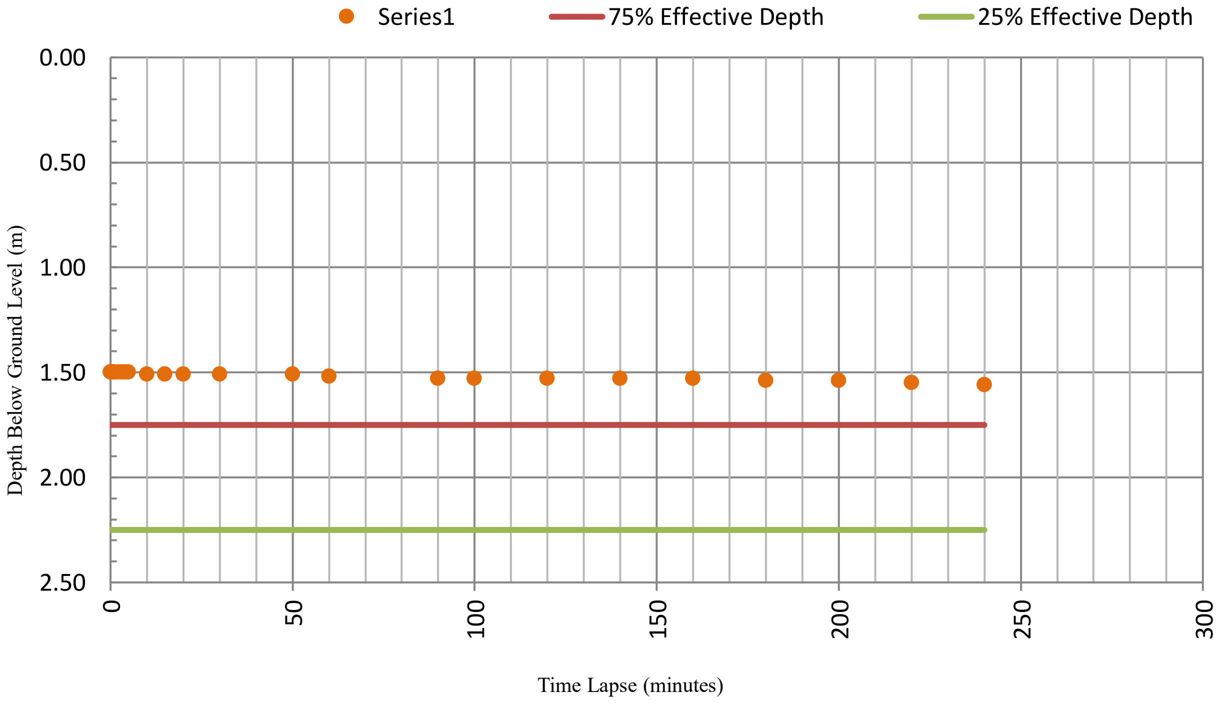
All dimensions in metres	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP106**
Job No. UA008926	Date 22/08/2017	Ground Level (mAOD) 77.41	Co-Ordinates E612677.41 W136513.96	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.30	Length	2.30
Width	0.50	Width	0.50
Depth	2.50	Depth	2.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.50	90	1.53
0.2	1.50	100	1.53
0.4	1.50	120	1.53
0.6	1.50	140	1.53
0.8	1.50	160	1.53
1	1.50	180	1.54
2	1.50	200	1.54
3	1.50	220	1.55
4	1.50	240	1.56
5	1.50		
10	1.51		
15	1.51		
20	1.51		
30	1.51		
50	1.51		
60	1.52		



Infiltration Rate = cannot be calculated due to lack of soakage

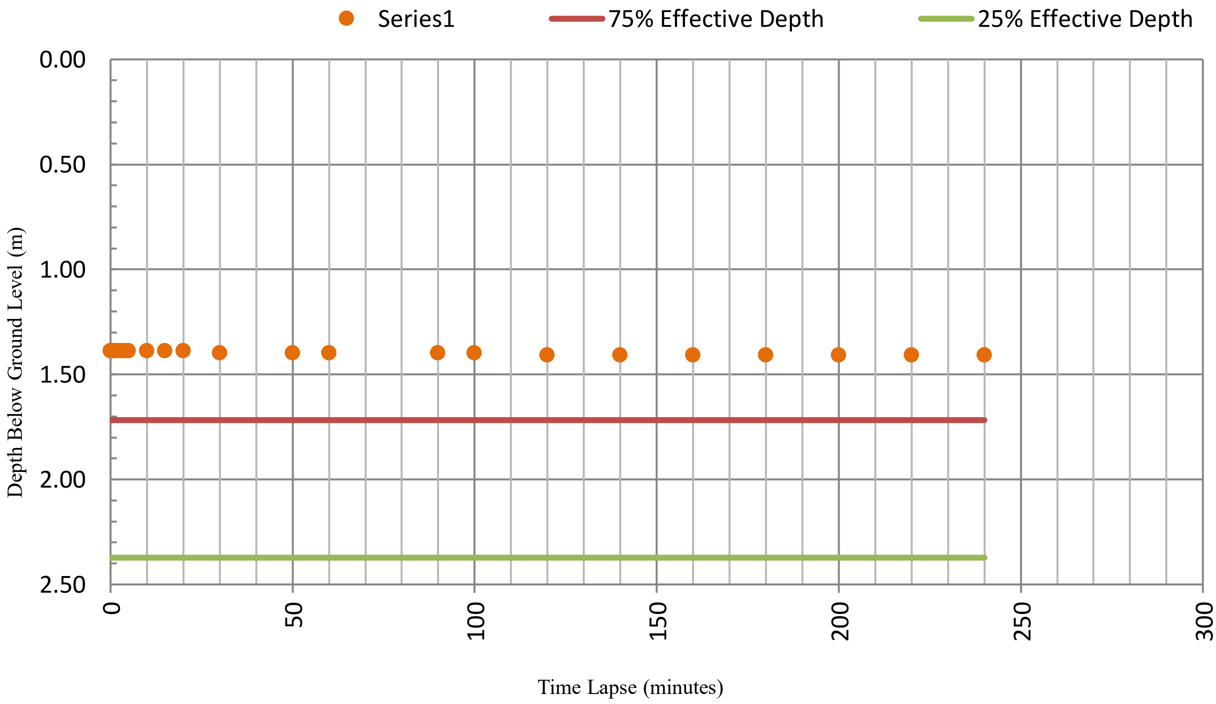
All dimensions in metres	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP107**
Job No. UA008926	Date 16/08/2017	Ground Level (mAOD) 92.67	Co-Ordinates E610704.30 W136503.22	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.20	Length	2.20
Width	0.50	Width	0.50
Depth	2.70	Depth	2.70

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.39	90	1.40
0.2	1.39	100	1.40
0.4	1.39	120	1.41
0.6	1.39	140	1.41
0.8	1.39	160	1.41
1	1.39	180	1.41
2	1.39	200	1.41
3	1.39	220	1.41
4	1.39	240	1.41
5	1.39		
10	1.39		
15	1.39		
20	1.39		
30	1.40		
50	1.40		
60	1.40		



Infiltration Rate = cannot be calculated due to lack of soakage

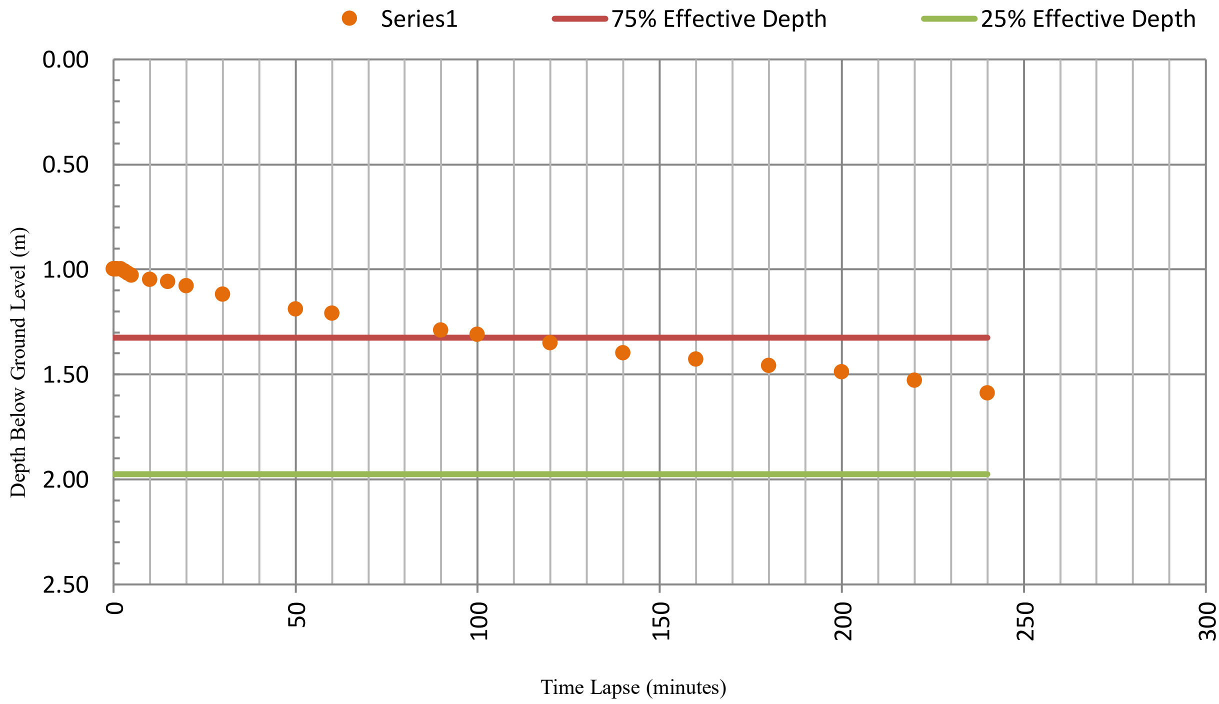
All dimensions in metres	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project				Trial Pit No
Otterpool Park				**TP108**
Job No. UA008926	Date 17/08/2017	Ground Level (mAOD) 73.04	Co-Ordinates E 611770.64 N 136484.47	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.20	Length	2.20
Width	0.50	Width	0.50
Depth	2.30	Depth	2.30

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.00	90	1.29
0.2	1.00	100	1.31
0.4	1.00	120	1.35
0.6	1.00	140	1.40
0.8	1.00	160	1.43
1	1.00	180	1.46
2	1.00	200	1.49
3	1.01	220	1.53
4	1.02	240	1.59
5	1.03		
10	1.05		
15	1.06		
20	1.08		
30	1.12		
50	1.19		
60	1.21		



Infiltration Rate = 8.69 x 10^{-6} m/s

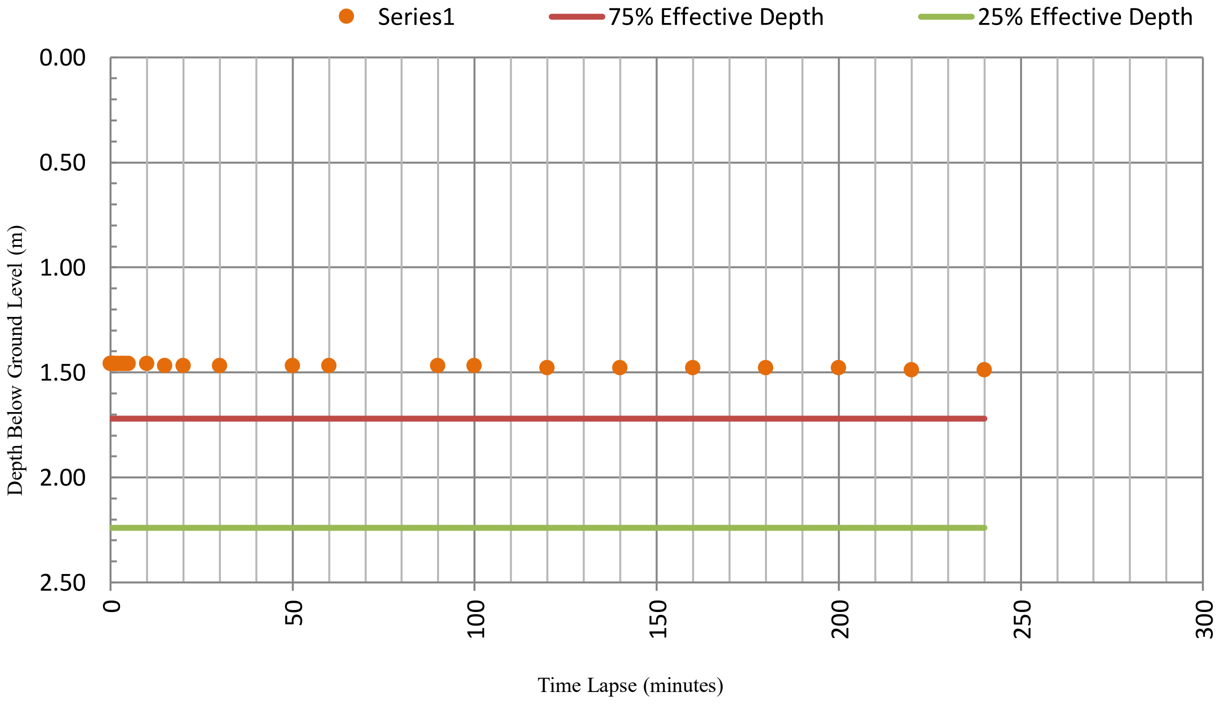
All dimensions in metres. 25% not attained, results are extrapolated.	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP109**
Job No. UA008926	Date 21/08/2017	Ground Level (mAOD) 80.25	Co-Ordinates E 612231.61 N 136228.20	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.30	Length	2.30
Width	0.50	Width	0.50
Depth	2.50	Depth	2.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.46	90	1.47
0.2	1.46	100	1.47
0.4	1.46	120	1.48
0.6	1.46	140	1.48
0.8	1.46	160	1.48
1	1.46	180	1.48
2	1.46	200	1.48
3	1.46	220	1.49
4	1.46	240	1.49
5	1.46		
10	1.46		
15	1.47		
20	1.47		
30	1.47		
50	1.47		
60	1.47		



Infiltration Rate = cannot be calculated due to lack of soakage

All dimensions in metres	Client Shepway District Council	Logged By HK

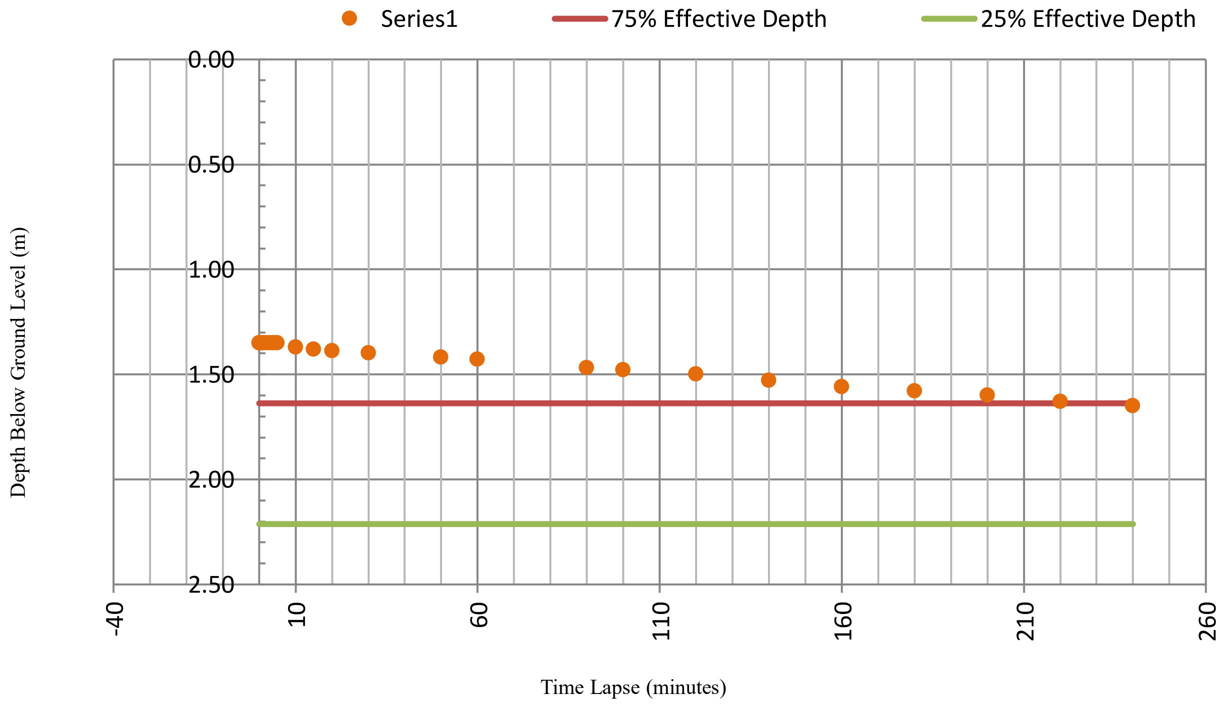
ARCADIS

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP110**
Job No. UA008926	Date 22/08/2017	Ground Level (mAOD) 101.14	Co-Ordinates E 610956.18 N 136019.59	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.10	Length	2.10
Width	0.50	Width	0.50
Depth	2.50	Depth	2.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.35	90	1.47
0.2	1.35	100	1.48
0.4	1.35	120	1.50
0.6	1.35	140	1.53
0.8	1.35	160	1.56
1	1.35	180	1.58
2	1.35	200	1.60
3	1.35	220	1.63
4	1.35	240	1.65
5	1.35		
10	1.37		
15	1.38		
20	1.39		
30	1.40		
50	1.42		
60	1.43		



Infiltration Rate = 4.15 x 10^{-6} m/s

All dimensions in metres. 25% not attained, results are extrapolated.	Client Shepway District Council	Logged By HK

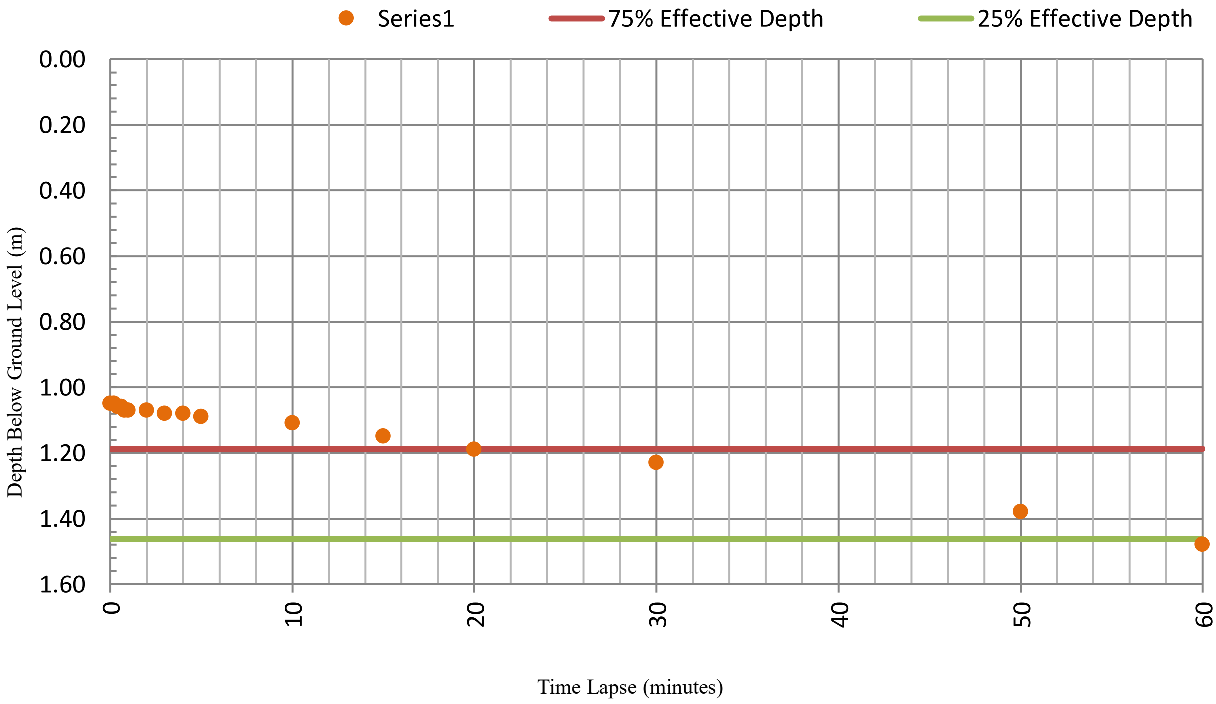
ARCADIS

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP112**
Job No. UA008926	Date 16/08/2017	Ground Level (mAOD) 96.44	Co-Ordinates E611665.00 W135941.12	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.30	Length	2.30
Width	0.50	Width	0.50
Depth	1.60	Depth	1.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.05		
0.2	1.05		
0.4	1.06		
0.6	1.06		
0.8	1.07		
1	1.07		
2	1.07		
3	1.08		
4	1.08		
5	1.09		
10	1.11		
15	1.15		
20	1.19		
30	1.23		
50	1.38		
60	1.48		



Infiltration Rate = 4.90 x 10^{-5} m/s

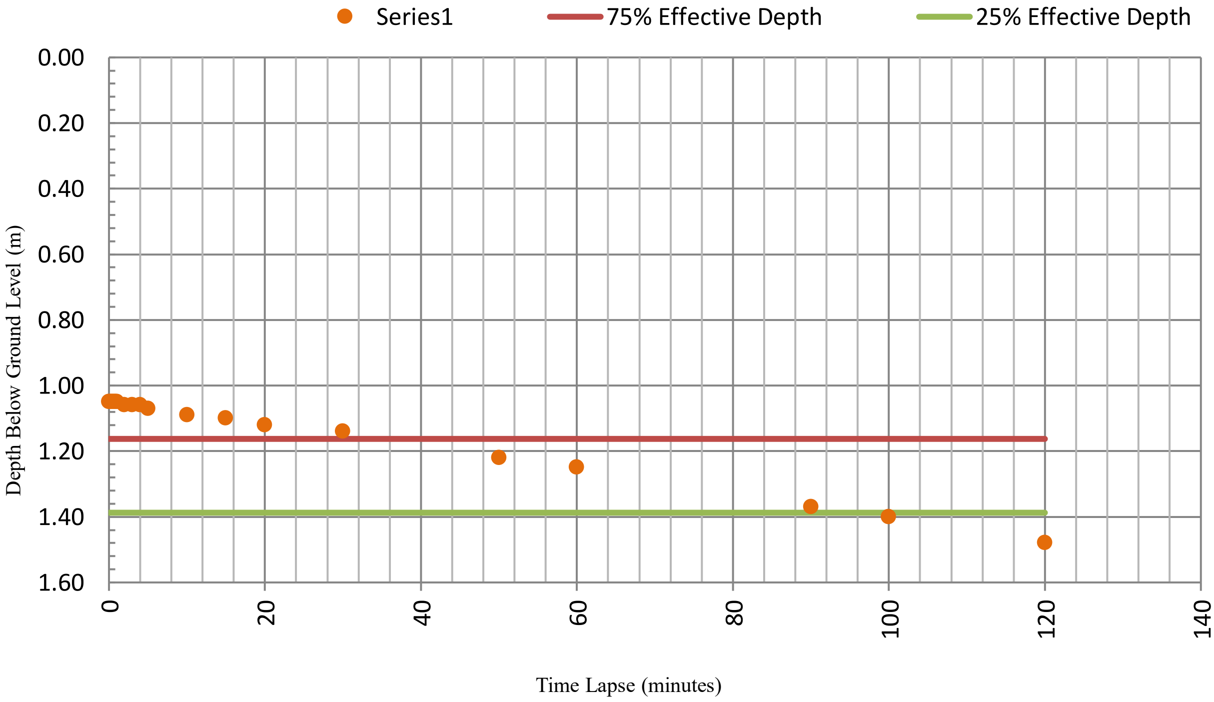
All dimensions in metres.	Client Shepway District Council	Logged By HK

SOAKAWAY INFILTRATION TEST

Project Otterpool Park				Trial Pit No **TP112**
Job No. UA008926	Date 16/08/2017	Ground Level (mAOD) 96.44	Co-Ordinates E611665.00 W135941.12	
Contractor Arcadis Consulting (UK) Limited				Sheet 1 of 1

Pit Dimension Prior To Test		Pit Dimension After Test	
Length	2.30	Length	2.30
Width	0.50	Width	0.50
Depth	1.50	Depth	1.50

Time Lapsed (minutes)	Depth to Water (m bgl)	Time Lapsed (minutes)	Depth to Water (m bgl)
0	1.05	90	1.37
0.2	1.05	100	1.40
0.4	1.05	120	1.48
0.6	1.05		
0.8	1.05		
1	1.05		
2	1.06		
3	1.06		
4	1.06		
5	1.07		
10	1.09		
15	1.10		
20	1.12		
30	1.14		
50	1.22		
60	1.25		



Infiltration Rate = 3.58 x 10^{-5} m/s

All dimensions in metres.	Client Shepway District Council	Logged By HK

Permeability Test

BH101

Project **Otterpool Park**	Project No. **UA008926-43-02**	Ground Level (m OD) **101.23**		
Client **Shepway District Council**	Easting (OD) **610,950.1**	Northing (OD) **136,019.1**	Test Date **08/09/2017**	Sheet **1 of 1**

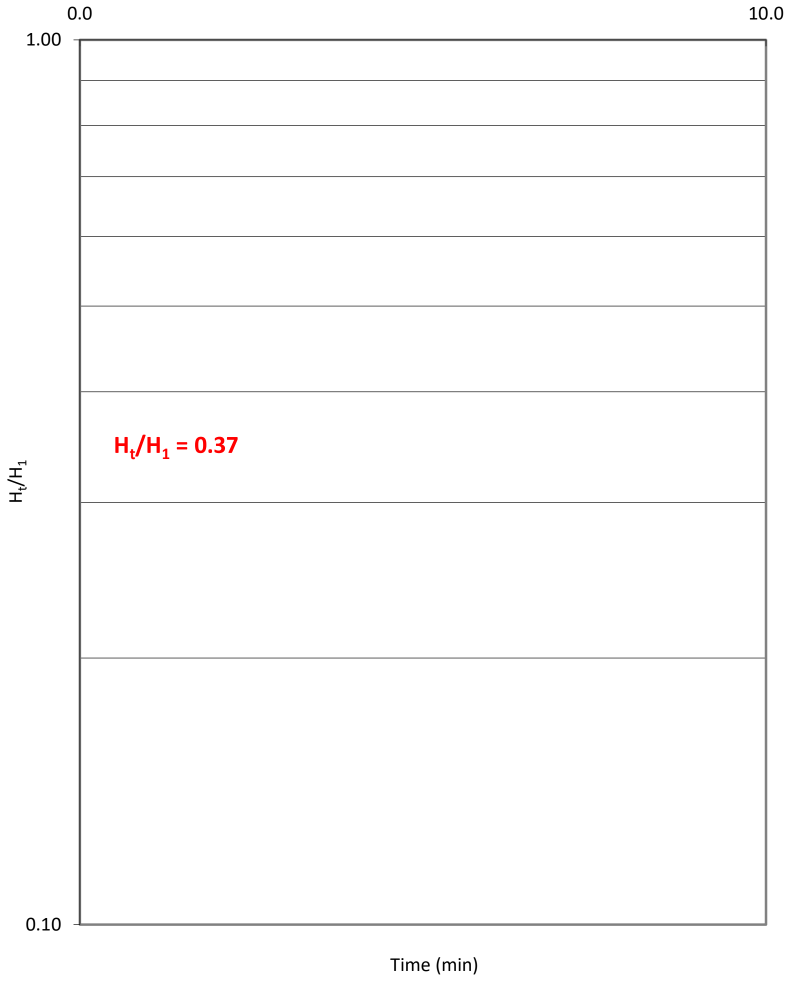
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	10.00
Depth to Pre Test Goundwater Level (m bgl):	9.92
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	6.00
Bottom of Test Section (m bgl):	10.00

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	10.00	1.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	0

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**#DIV/0!**

Remarks

Unable to maintain a head of water. Entire IBC (1000 L) emptied into borehole in 6 minutes

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**0**

Permeability Test

BH103

Project
Otterpool Park

Project No.
UA008926-43-02

Ground Level (m OD)
101.23

Client
Shepway District Council

Easting (OD)
611,768.1

Northing (OD)
136,019.1

Test Date
08/09/2017

Sheet
1 of 1

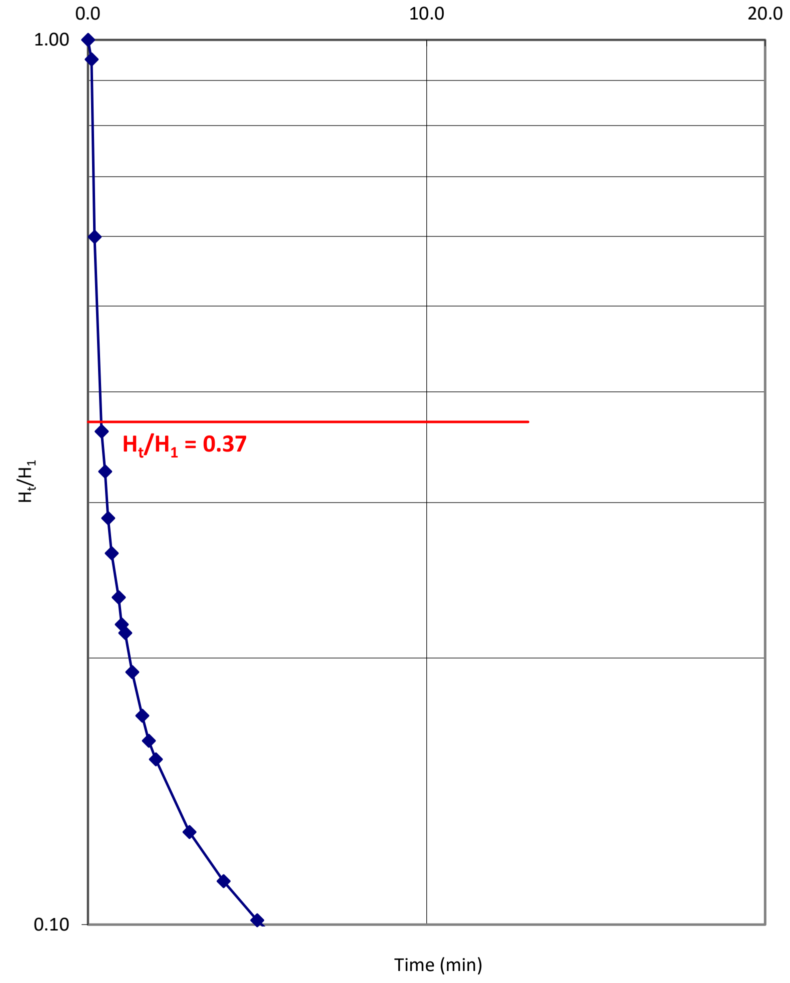
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	10.00
Depth to Pre Test Goundwater Level (m bgl):	1.84
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	4.00
Bottom of Test Section (m bgl):	10.00

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	10.00	1.00
0.1	0.09	9.91	0.95
0.2	0.74	9.26	0.60
0.4	1.18	8.82	0.36
0.4	1.18	8.82	0.36
0.5	1.24	8.76	0.33
0.6	1.31	8.69	0.29
0.7	1.36	8.64	0.26
0.9	1.41	8.59	0.23
0.9	1.41	8.59	0.23
1	1.44	8.56	0.22
1.1	1.45	8.55	0.21
1.3	1.49	8.52	0.19
1.6	1.52	8.48	0.17
1.8	1.54	8.46	0.16
2	1.56	8.44	0.15
3	1.61	8.39	0.13
4	1.63	8.37	0.11
5	1.65	8.35	0.10
6	1.67	8.33	0.09
7	1.68	8.32	0.09
8	1.69	8.31	0.08
9	1.70	8.31	0.08



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	23.4

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**1.22E-05**

Remarks
For the permeabilty test, 100 litres of water was added to the borehole.

Engineer/Technitian
Arcadis

Calculation By
RD

Checked By
IP

Permeability Test

BH103

Project	Project No.	Ground Level (m OD)		
Otterpool Park	**UA008926-43-02**	**101.23**		
Client	**Easting (OD)**	**Northing (OD)**	**Test Date**	**Sheet**
Shepway District Council	**611,768.1**	**136,019.1**	**08/09/2017**	**1 of 1**

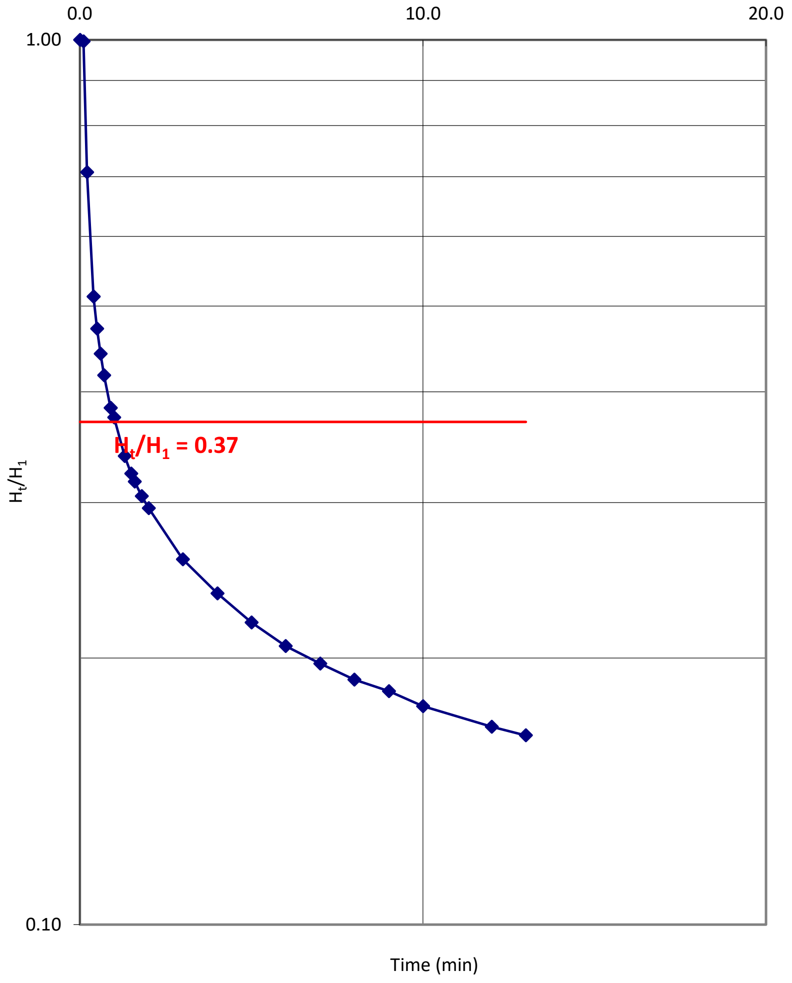
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	10.00
Depth to Pre Test Goundwater Level (m bgl):	1.84
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	4.00
Bottom of Test Section (m bgl):	10.00

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	10.00	1.00
0.1	0.01	9.99	1.00
0.2	0.54	9.46	0.71
0.4	0.90	9.10	0.51
0.4	0.90	9.10	0.51
0.5	0.97	9.03	0.47
0.6	1.03	8.97	0.44
0.7	1.07	8.93	0.42
0.9	1.13	8.87	0.38
0.9	1.13	8.87	0.38
1	1.15	8.85	0.37
1.3	1.22	8.78	0.34
1.5	1.25	8.76	0.32
1.6	1.26	8.74	0.32
1.8	1.28	8.72	0.30
2	1.30	8.70	0.30
3	1.36	8.64	0.26
4	1.40	8.60	0.24
5	1.44	8.56	0.22
6	1.46	8.54	0.21
7	1.48	8.52	0.20
8	1.49	8.51	0.19
9	1.50	8.50	0.18



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	62.4

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**4.57E-06**

Remarks

For the permeabilty test, 300 litres of water was added to the borehole.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**IP**

Permeability Test

BH103

Project	Project No.	Ground Level (m OD)		
Otterpool Park	**UA008926-43-02**	**101.23**		

Client	Easting (OD)	Northing (OD)	Test Date	Sheet
Shepway District Council	**611,768.1**	**136,019.1**	**08/09/2017**	**1 of 1**

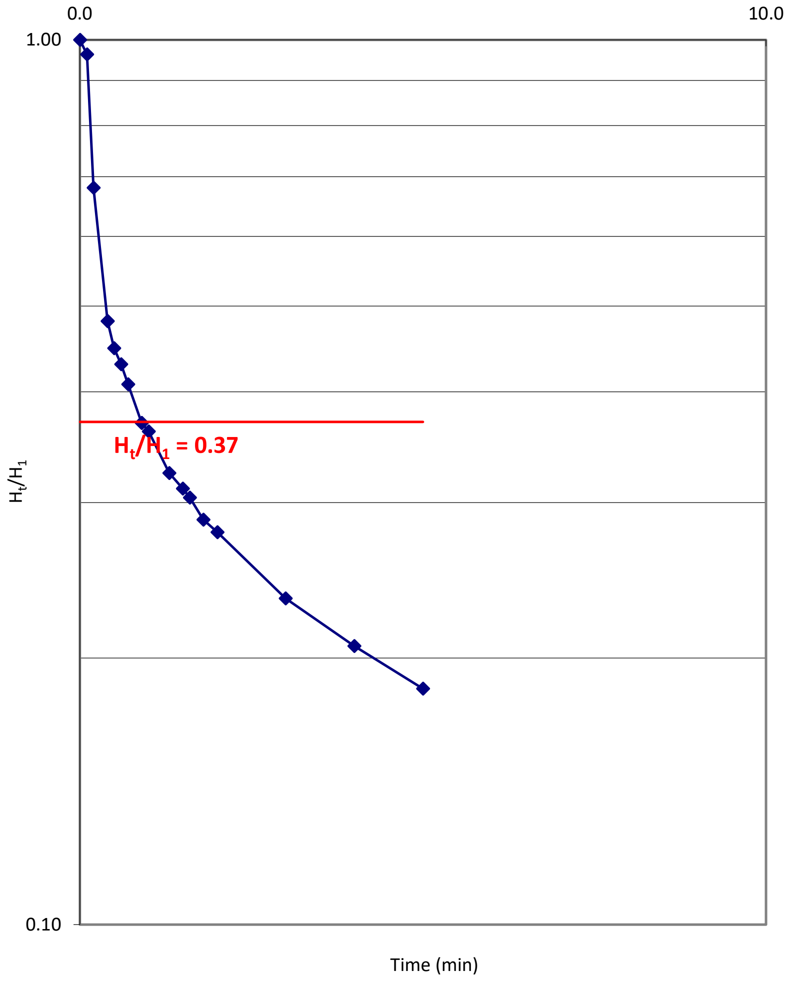
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	10.00
Depth to Pre Test Goundwater Level (m bgl):	1.84
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	4.00
Bottom of Test Section (m bgl):	10.00

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	10.00	1.00
0.1	0.07	9.93	0.96
0.2	0.59	9.41	0.68
0.4	0.96	9.05	0.48
0.4	0.96	9.05	0.48
0.5	1.02	8.99	0.45
0.6	1.05	8.95	0.43
0.7	1.09	8.91	0.41
0.9	1.16	8.84	0.37
0.9	1.16	8.84	0.37
1	1.18	8.82	0.36
1.3	1.24	8.76	0.32
1.5	1.27	8.73	0.31
1.6	1.28	8.72	0.30
1.8	1.31	8.69	0.29
2	1.33	8.67	0.28
3	1.41	8.59	0.23
4	1.46	8.54	0.21
5	1.50	8.50	0.18
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00
0	0.00	10.00	0.00



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	53.4

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**5.35E-06**

Remarks

For the permeabilty test, 600 litres of water was added to the borehole.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**IP**

Permeability Test

BH104

Project	Project No.	Ground Level (m OD)		
Otterpool Park	**UA008926-43-02**	**94.56**		

Client	Easting (OD)	Northing (OD)	Test Date	Sheet
Shepway District Council	**611,750.5**	**135,820.1**	**08/09/2017**	**1 of 1**

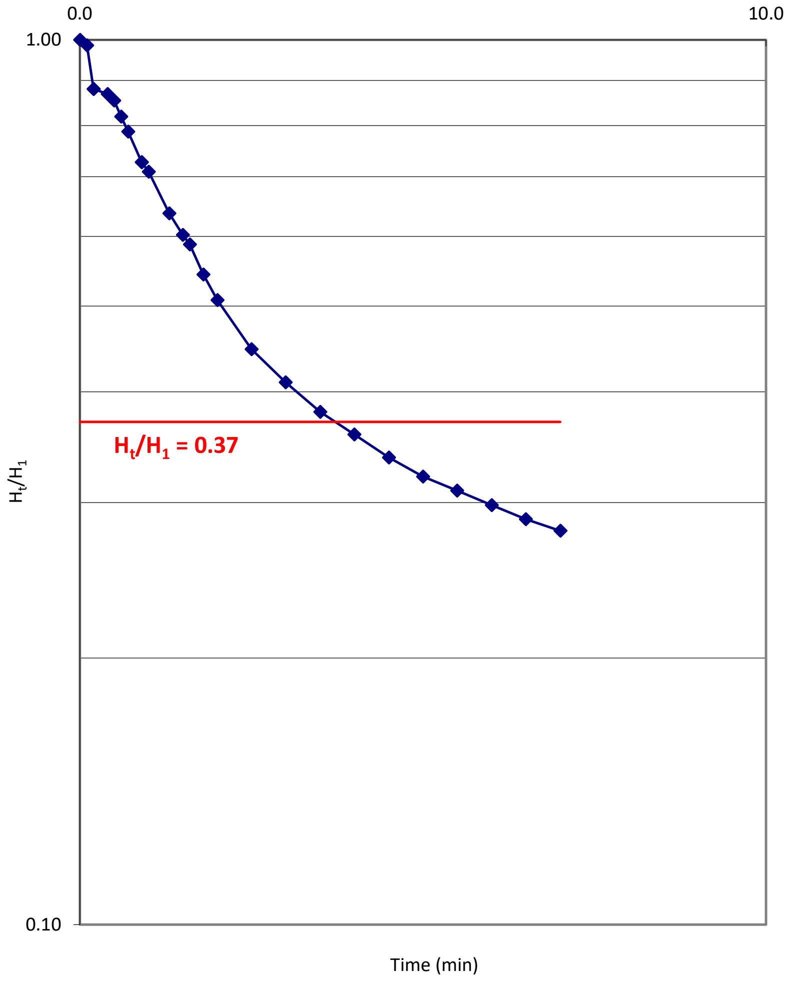
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	9.95
Depth to Pre Test Goundwater Level (m bgl):	3.47
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	2.00
Bottom of Test Section (m bgl):	9.95

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	9.95	1.00
0.1	0.05	9.90	0.99
0.2	0.42	9.53	0.88
0.2	0.42	9.53	0.88
0.4	0.46	9.49	0.87
0.5	0.51	9.44	0.85
0.6	0.63	9.32	0.82
0.7	0.74	9.21	0.79
0.9	0.95	9.01	0.73
0.9	0.95	9.01	0.73
1	1.01	8.94	0.71
1.3	1.26	8.69	0.64
1.5	1.38	8.57	0.60
1.6	1.43	8.52	0.59
1.8	1.59	8.36	0.54
2	1.71	8.24	0.51
2.5	1.92	8.03	0.45
3	2.05	7.90	0.41
3.5	2.15	7.80	0.38
4	2.23	7.72	0.36
4.5	2.30	7.65	0.34
5	2.36	7.59	0.32
5.5	2.40	7.55	0.31



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	223.2

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**1.01E-06**

Remarks

For the permeabilty test, 300 litres of water was added to the borehole.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**IP**

ARCADIS

Permeability Test

BH104

Project **Otterpool Park**	Project No. **UA008926-43-02**	Ground Level (m OD) **94.56**		
Client **Shepway District Council**	Easting (OD) **611,750.5**	Northing (OD) **135,820.1**	Test Date **08/09/2017**	Sheet **1 of 1**

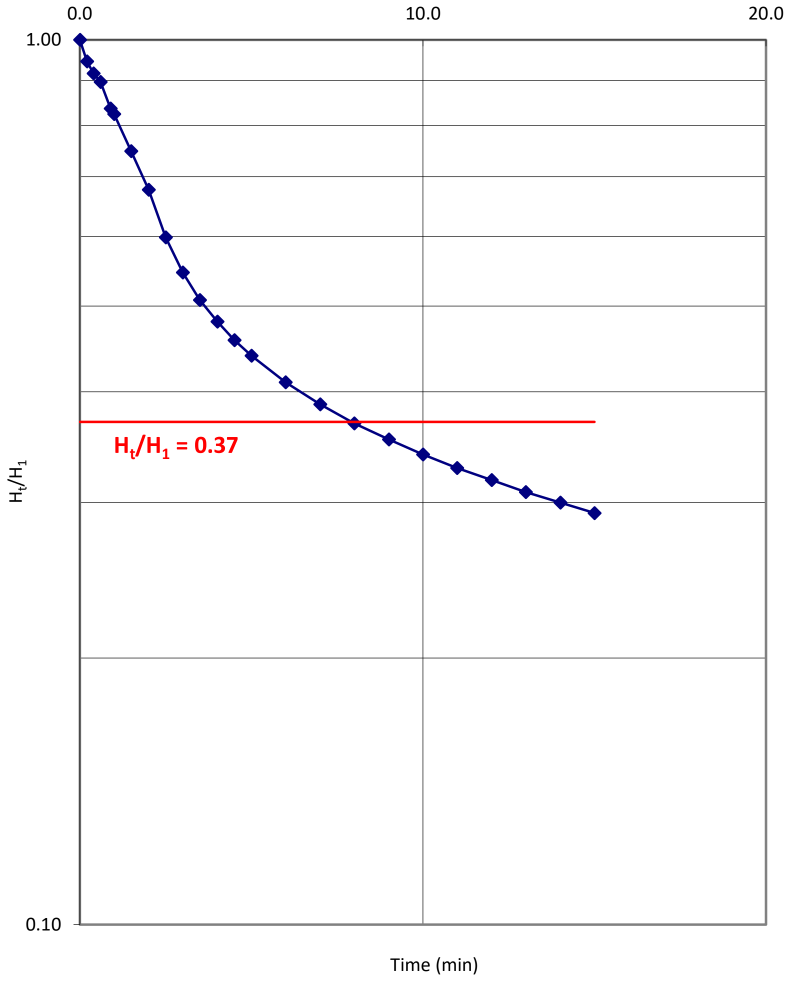
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	9.95
Depth to Pre Test Goundwater Level (m bgl):	3.47
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	2.00
Bottom of Test Section (m bgl):	9.95

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	9.95	1.00
0.2	0.19	9.76	0.95
0.4	0.29	9.66	0.92
0.6	0.36	9.59	0.90
0.9	0.57	9.38	0.84
1	0.61	9.34	0.82
1.5	0.87	9.08	0.75
2	1.12	8.83	0.68
2.5	1.40	8.56	0.60
3	1.58	8.37	0.55
3.5	1.71	8.24	0.51
4	1.80	8.15	0.48
4.5	1.88	8.07	0.46
5	1.94	8.01	0.44
6	2.05	7.90	0.41
7	2.13	7.82	0.39
8	2.19	7.76	0.37
9	2.24	7.71	0.35
10	2.29	7.66	0.34
11	2.33	7.62	0.33
12	2.37	7.58	0.32
13	2.40	7.55	0.31
14	2.43	7.52	0.30



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	475.2

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**4.77E-07**

Remarks

For the permeabilty test, 600 litres of water was added to the borehole.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**IP**

ARCADIS

Permeability Test

BH105

Project	Project No.	Ground Level (m OD)		
Otterpool Park	**UA008926-43-02**	**79.97**		
Client	Easting (OD)	Northing (OD)	Test Date	Sheet
Shepway District Council	**613,555.5**	**136,952.2**	**08/09/2017**	**1 of 1**

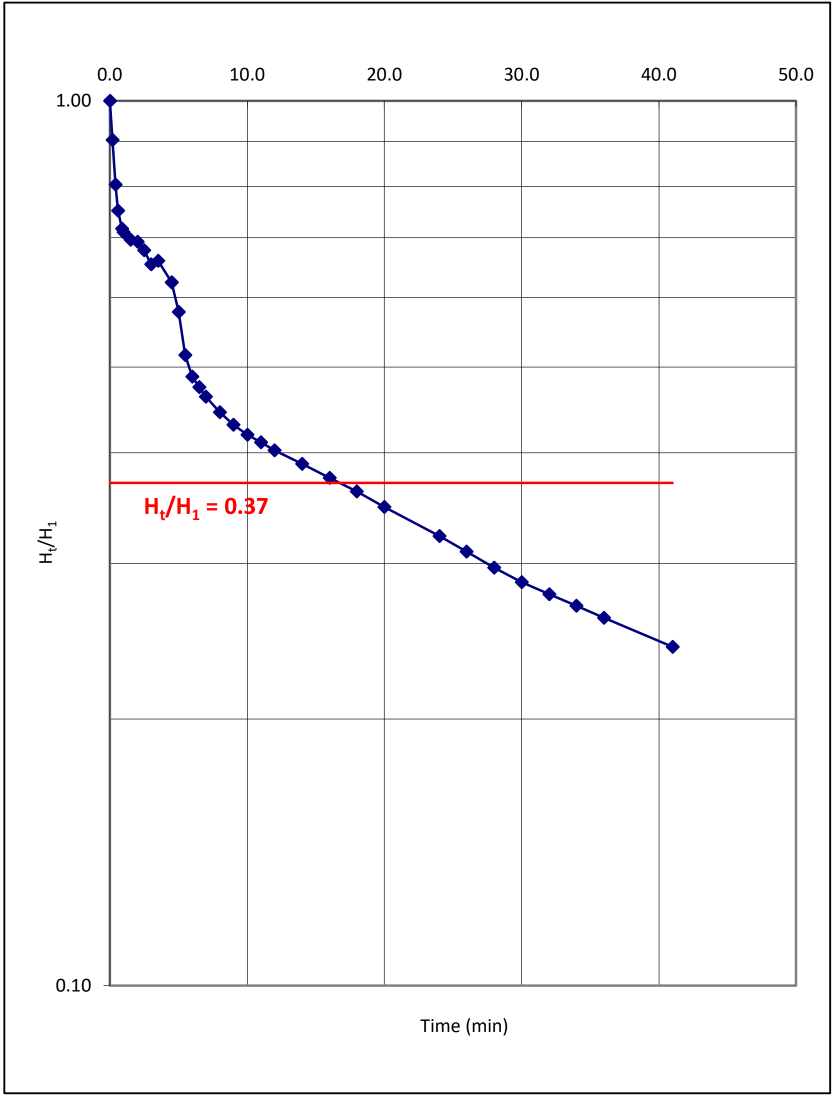
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	10.00
Depth to Pre Test Goundwater Level (m bgl):	3.69
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	2.00
Bottom of Test Section (m bgl):	10.00

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	10.00	1.00
0.2	0.36	9.64	0.90
0.4	0.72	9.28	0.80
0.6	0.92	9.09	0.75
0.9	1.04	8.96	0.72
1	1.07	8.93	0.71
1.5	1.12	8.88	0.70
2	1.13	8.87	0.69
2.5	1.19	8.81	0.68
3	1.28	8.72	0.65
3.5	1.25	8.75	0.66
4.5	1.39	8.61	0.62
4.5	1.39	8.61	0.62
5	1.56	8.44	0.58
5.5	1.78	8.22	0.52
6	1.89	8.11	0.49
6.5	1.94	8.06	0.47
7	1.98	8.02	0.46
8	2.05	7.96	0.45
9	2.10	7.90	0.43
10	2.14	7.86	0.42
11	2.17	7.83	0.41
12	2.20	7.80	0.40



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	1004.4

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**2.24E-07**

Remarks

For the permeabilty test, 200 litres of water was added to the borehole.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**IP**

Permeability Test

BH105

Project	Project No.	Ground Level (m OD)		
Otterpool Park	**UA008926-43-0**	**79.97**		
Client	**Easting (OD)**	**Northing (OD)**	**Test Date**	**Sheet**
Shepway District Council	**613,555.5**	**136,952.2**	**08/09/2017**	**1 of 1**

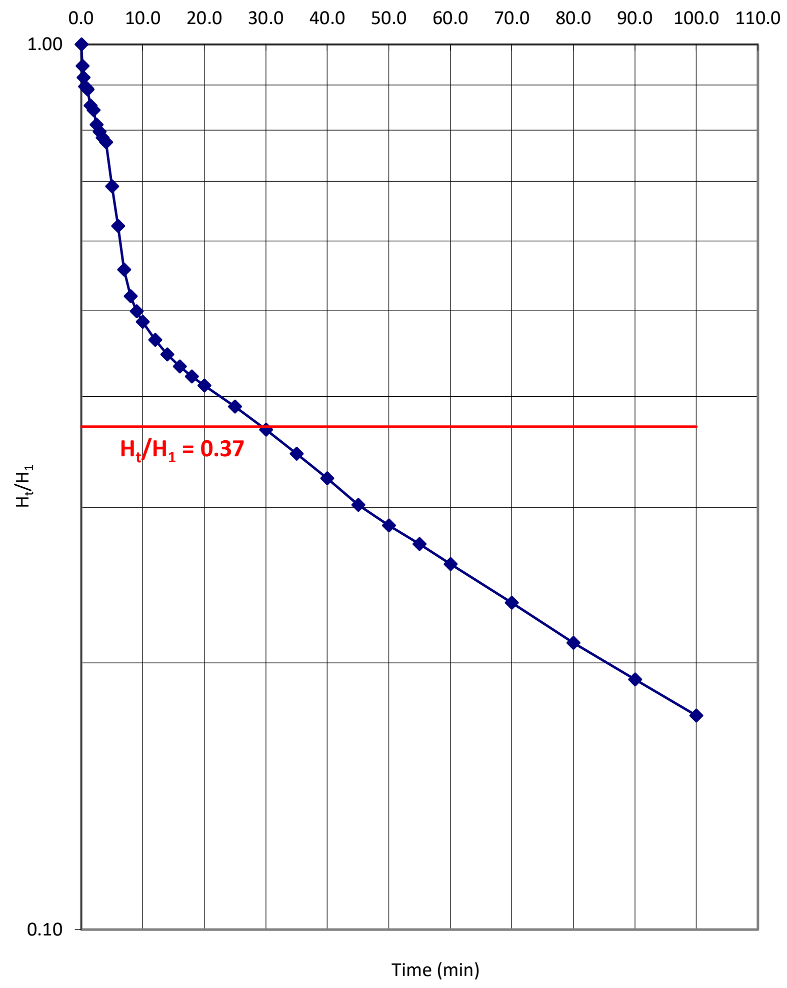
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	10.00
Depth to Pre Test Goundwater Level (m bgl):	3.69
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	2.00
Bottom of Test Section (m bgl):	10.00

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	10.00	1.00
0.2	0.20	9.80	0.95
0.4	0.30	9.70	0.92
0.6	0.38	9.62	0.90
0.9	0.40	9.60	0.89
1	0.41	9.59	0.89
1.5	0.54	9.46	0.85
2	0.58	9.42	0.84
2.5	0.69	9.31	0.81
3	0.75	9.25	0.80
3.5	0.79	9.21	0.78
4	0.83	9.17	0.78
5	1.14	8.86	0.69
6	1.39	8.61	0.62
7	1.63	8.37	0.56
8	1.77	8.23	0.52
9	1.85	8.16	0.50
10	1.89	8.11	0.49
12	1.98	8.02	0.46
14	2.04	7.96	0.45
16	2.09	7.91	0.43
18	2.13	7.87	0.42
20	2.17	7.83	0.41



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	1761

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**1.28E-07**

Remarks

For the permeabilty test, 300 litres of water was added to the borehole.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**IP**

Permeability Test

WS112

Project	Project No.	Ground Level (m OD)		
Otterpool Park	**UA008926-43-02**	**99.93**		
Client	**Easting (OD)**	**Northing (OD)**	**Test Date**	**Sheet**
Shepway District Council	**610,977.8**	**136,085.2**	**08/09/2017**	**1 of 1**

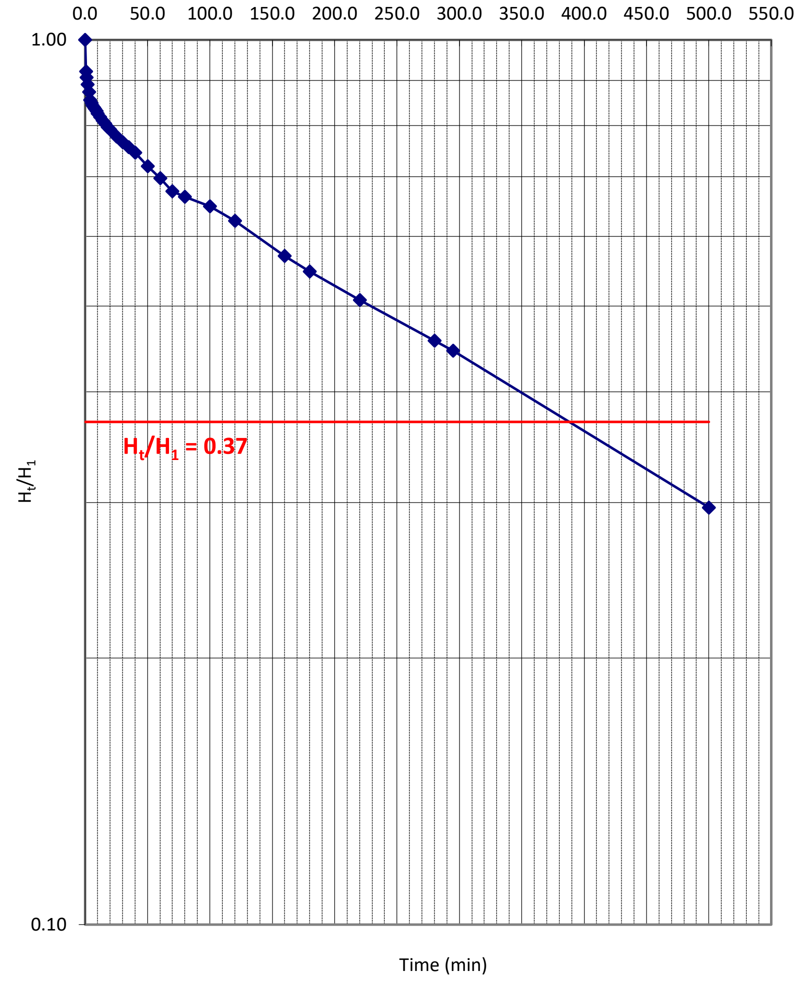
Depth & Purge Records:

Variable Head Test Type:	Falling Head
Depth to Base of Borehole (m bgl):	3.50
Depth to Pre Test Goundwater Level (m bgl):	3.41
Time Taken to Purge (minutes):	0
Volume of Water Purged (ltrs):	0

Response Zone Details:

Installation Diameter (m):	0.05
Height of Installation above GL (m):	0.00
Diameter of Borehole (m):	0.05
Top of Test Section (m bgl):	1.00
Bottom of Test Section (m bgl):	3.50

Elapsed Time (minutes)	Depth to Water (m bgl)	Head (m)	Proportional Head (H_t/H_o)
0	0.00	3.50	1.00
0.5	0.27	3.23	0.92
1	0.32	3.18	0.91
2	0.38	3.13	0.89
3	0.43	3.07	0.87
4	0.49	3.01	0.86
5	0.52	2.99	0.85
6	0.53	2.97	0.84
7	0.55	2.95	0.84
8	0.56	2.94	0.83
9	0.58	2.92	0.83
10	0.59	2.91	0.83
12	0.62	2.88	0.82
14	0.65	2.85	0.81
16	0.67	2.83	0.80
18	0.69	2.81	0.80
20	0.71	2.79	0.79
25	0.76	2.74	0.78
30	0.80	2.70	0.77
35	0.83	2.67	0.76
40	0.87	2.63	0.75
50	0.96	2.55	0.72
60	1.03	2.47	0.70



Calculated Parameters

Cross Sectional Area of Response Zone:	1.96E-03
Intake Factor:	1.00E-01
Time Lag (seconds):	23100

NOTE: Ht/Ho = 0.37 has not been satisfied. Therefore data has been extrapolated from the last two readings to achive Ht/Ho = 0.37. Permeability is therefore approximate only.

Permeability (m/s)	**2.49E-08**

Remarks

For the permeabilty test, ~20 litres of water was added to the borehole. V. Slow infiltration - results have been extrapolated.

Engineer/Technitian	Calculation By	Checked By
Arcadis	**RD**	**0**

APPENDIX F

GEOTECHNICAL LABORATORY TEST DATA

UKAS TESTING
2788

Laboratory Report

GSTL
GEO Site & Testing Services Ltd

Contract Number: 36503

Client's Reference: **UA008926** Report Date: **29-09-2017**

Client **Arcadis**
Fortran Rd
St Mellons
Cardiff
CF3 0EY

Contract Title: **OtterPool Park**
For the attention of: **Ian Parsons**

Date Received: **05-09-2017**
Date Commenced: **05-09-2017**
Date Completed: **29-09-2017**

Test Description	Qty
Moisture Content 1377 : 1990 Part 2 : 3.2 - * UKAS	32
4 Point Liquid & Plastic Limit (LL/PL) 1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS	17
PSD Wet Sieve method 1377 : 1990 Part 2 : 9.2 - * UKAS	16
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) 1377 : 1990 Part 2 : 9.4 - * UKAS	6
(GI) BRE Suite Total Sulphate, Aqueous Sulphate, Total Sulphur, Aqueous Nitrate, Aqueous Mag, Chloride, 1377 : 1990 Part 3 & BRE CP2/79 - @ Non Accredited Test	12
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould) 1377 : 1990 Part 4 : 3.3 - * UKAS	6
Disposal of Samples on Project	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:
Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative Assistant)
Vaughan Edwards (Managing Director) - Wayne Honey (Administrative/Quality Assistant)

GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)
DESCRIPTIONS

Contract Number	**36503**	
Site Name	**Otterpool Park**	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH101	4	B	0.75	-	1.00	Brown fine to coarse gravelly sandy silty CLAY.
BH103	3	D	0.50	-		Brown slightly sandy clayey SILT.
BH103	7	D	1.00	-		Brown slightly sandy silty CLAY.
BH103	9	D	2.00	-		Brown slightly silty CLAY.
BH104	2	B	7.00	-	8.00	Grey/brown slightly sandy silty CLAY.
BH105	13	D	6.00	-		Grey/brown slightly sandy clayey SILT.
TP101	4	B	0.50	-		Brown slightly silty sandy CLAY.
TP102	7	B	1.10	-		Brown slightly silty slightly sandy CLAY.
TP102	1	D	1.80	-		Brown slightly silty slightly sandy CLAY.
TP103	10	B	1.50	-		Brown slightly fine to coarse gravelly silty clayey fine to coarse SAND.
TP104	7	B	1.00	-		Brown fine to coarse gravelly slightly sandy silty CLAY.
TP105	5	D	0.50	-		Brown slightly sandy clayey SILT.
TP105	7	B	1.00	-		Brown slightly sandy silty CLAY.
TP105	1	D	1.50	-		Brown silty CLAY.
TP106	10	B	1.50	-		Brown slightly silty slightly sandy CLAY.
TP106	2	B	2.00	-		Brown silty CLAY.
TP107	7	B	1.00	-		Brown silty clayey SAND.
TP107	10	B	1.60	-		Brown sandy silty CLAY.
TP108	5	D	0.60	-		Brown sandy silty CLAY.
TP110	8	D	1.00	-		Brown sandy silty CLAY.
TP110	1	D	1.80	-		Brown slightly silty slightly sandy fine to coarse gravelly CLAY.
TP111	10	B	1.60	-		Brown fine gravelly clayey SILT.
				-		
				-		

Operators	Checked	27-09-17	Ben Sharp (Contracts Manager)
Jordan Simmonite	Approved	27-09-17	Paul Evans (Quality/Technical Manager)

UKAS TESTING
2788

GSTL

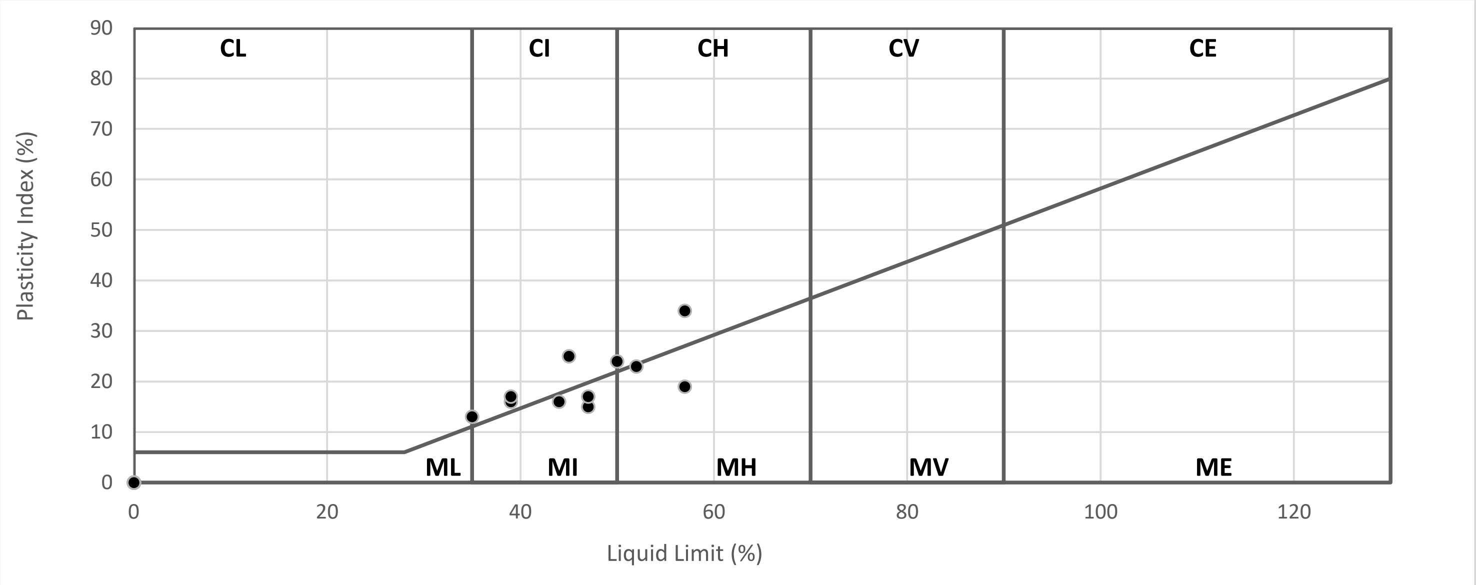
LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)

Contract Number	**36503**
Site Name	**Otterpool Park**

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
BH101	4	B	0.75	-	1.00	17	39	23	16	78	CI Intermediate Plasticity
BH103	3	D	0.50	-		17					
BH103	7	D	1.00	-		20					
BH103	9	D	2.00	-		31					
BH104	2	B	7.00	-	8.00	31	52	29	23	100	MH High Plasticity
BH105	13	D	6.00	-		27	47	32	15	100	MI Intermediate Plasticity
TP101	4	B	0.50	-		21	50	26	24	98	CI/H Inter/High Plasticity
TP102	7	B	1.10	-		18	57	23	34	100	CH High Plasticity
TP102	1	D	1.80	-		24					
TP103	10	B	1.50	-		28	35	22	13	94	CL/I Low/Inter. Plasticity
TP104	7	B	1.00	-		21	39	22	17	78	CI Intermediate Plasticity
TP105	5	D	0.50	-		37	47	30	17	100	MI Intermediate Plasticity
TP105	7	B	1.00	-		29	45	20	25	100	CI Intermediate Plasticity
TP105	1	D	1.50	-		34					
TP106	10	B	1.50	-		27	44	28	16	100	MI Intermediate Plasticity
TP106	2	B	2.00	-		25					
TP107	7	B	1.00	-		26					
TP107	10	B	1.60	-		23					
TP108	5	D	0.60	-		18					
TP110	8	D	1.00	-		14					
TP110	1	D	1.80	-		16					
TP111	10	B	1.60	-		44	57	38	19	79	MH High Plasticity
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Operators	Checked	27-09-17	Ben Sharp (Contracts Manager)
Jordan Simmonite	Approved	27-09-17	Paul Evans (Quality/Technical Manager)

UKAS TESTING 2788

GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)
DESCRIPTIONS

Contract Number	**36503**	
Site Name	**Otterpool Park**	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
TP113	5	D	0.60	-		Brown slightly silty slightly sandy CLAY.
TP113	10	B	1.40	-		Brown slightly silty slightly sandy CLAY.
TP113	7	D	2.50	-		Grey slightly silty fine to coarse gravelly CLAY.
WS104C	14	B	1.20	-	1.80	Brown slightly silty sandy fine to coarse gravelly CLAY.
WS106	10	B	1.40	-	2.00	Brown slightly silty CALY.
WS107	11	B	0.70	-	1.00	Brown slightly silty slightly sandy fine to coarse gravelly CLAY.
WS108	15	B	1.20	-	2.00	Brown slightly sandy silty CLAY.
WS110	16	B	0.70	-	1.00	Brown fine to coarse gravelly sandy silty CLAY.
WS110	8	D	1.80	-	2.00	Brown slightly silty slightly sandy CLAY.
WS110	9	D	2.10	-	2.20	Brown slightly sandy silty CLAY.
				-		
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				-		
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				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

Operators	Checked	27-09-17	Ben Sharp (Contracts Manager)
Jordan Simmonite	Approved	27-09-17	Paul Evans (Quality/Technical Manager)

UKAS TESTING 2788

GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)

Contract Number	**36503**
Site Name	**Otterpool Park**

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
TP113	5	D	0.60	-		14					
TP113	10	B	1.40	-		31	42	28	14	100	MI Intermediate Plasticity
TP113	7	D	2.50	-		26					
WS104C	14	B	1.20	-	1.80	22	35	15	20	76	CL/I Low/Inter. Plasticity
WS106	10	B	1.40	-	2.00	20	38	21	17	100	CI Intermediate Plasticity
WS107	11	B	0.70	-	1.00	16	32	21	11	84	CL Low Plasticity
WS108	15	B	1.20	-	2.00	34	58	24	34	96	CH High Plasticity
WS110	16	B	0.70	-	1.00	17	39	23	16	74	CI Intermediate Plasticity
WS110	8	D	1.80	-	2.00	28					
WS110	9	D	2.10	-	2.20	21					
				-							
				-							
				-							
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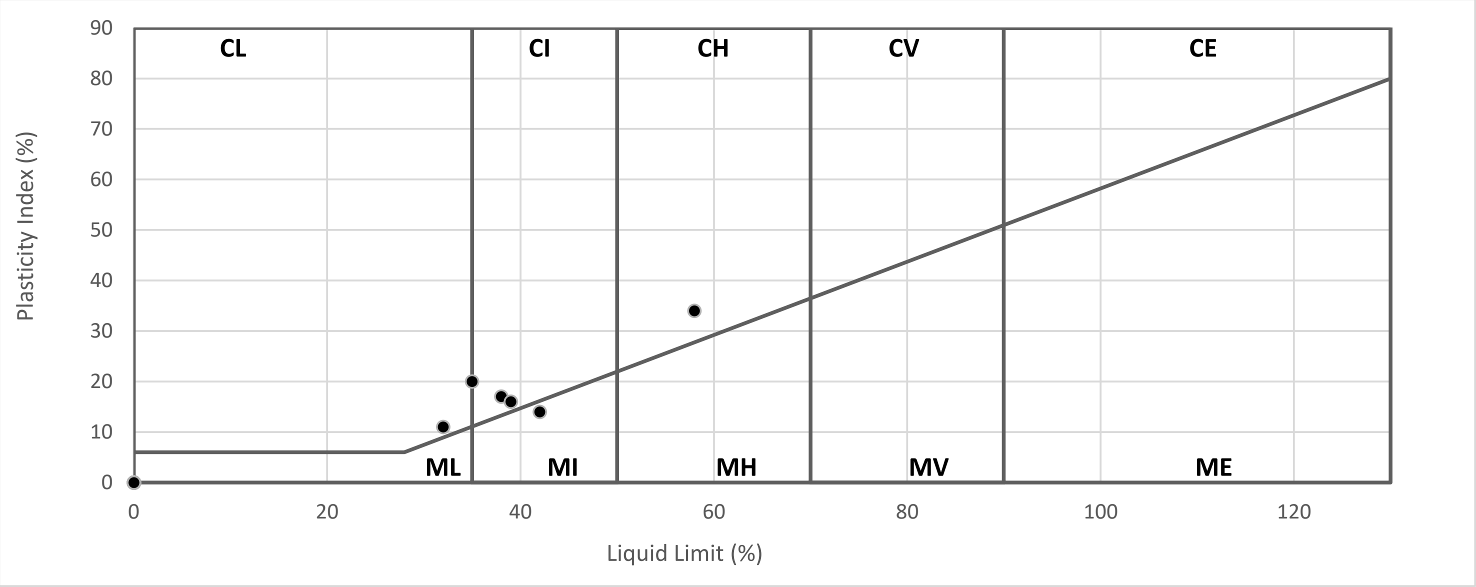
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

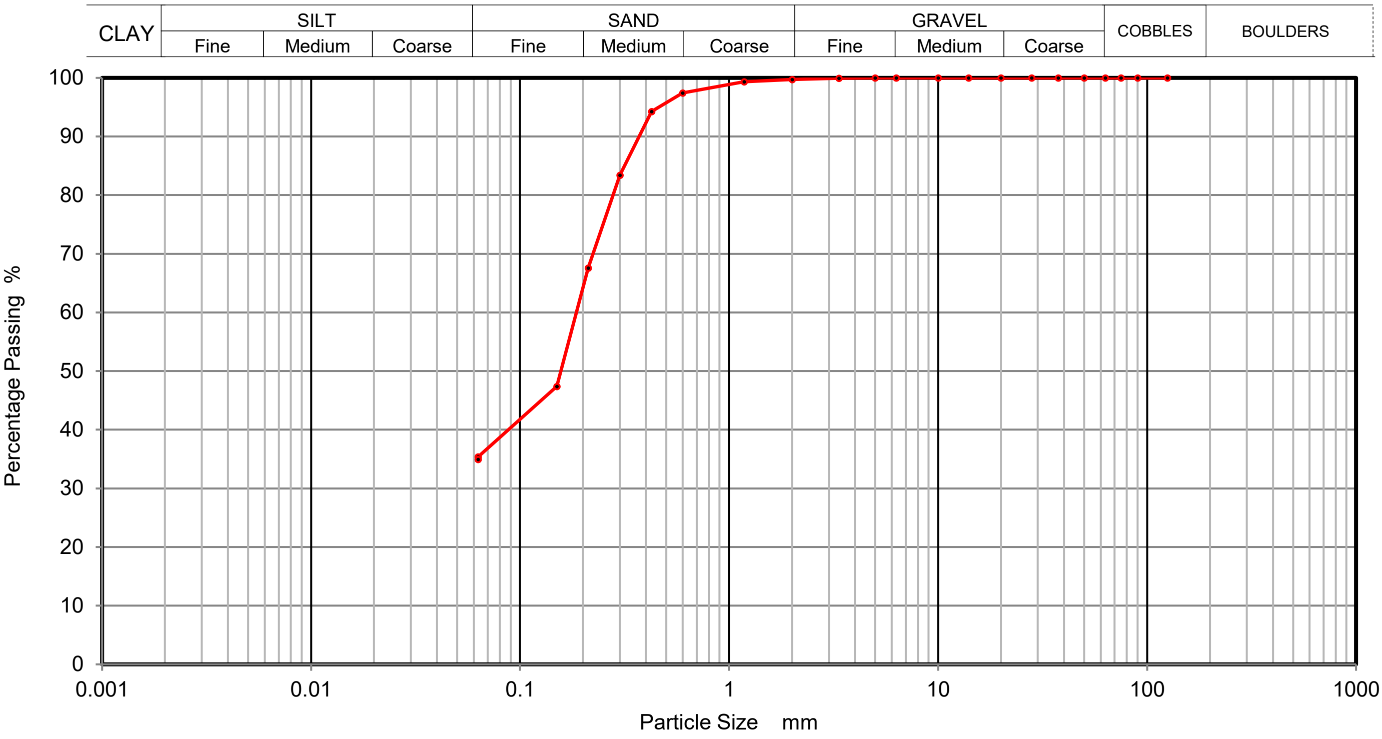
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Operators	Checked	27-09-17	Ben Sharp (Contracts Manager)
Jordan Simmonite	Approved	27-09-17	Paul Evans (Quality/Technical Manager)

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**BH102**
Site Name	**Otterpool Park**	Sample No.	**8**
Soil Description	Brown silty clayey fine to coarse SAND.	Depth Top	**2.00**
		Depth Base	**3.00**
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	97		
0.425	94		
0.3	83		
0.212	68		
0.15	47		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	65
Silt and Clay	35

Grading Analysis	
Uniformity Coefficient	

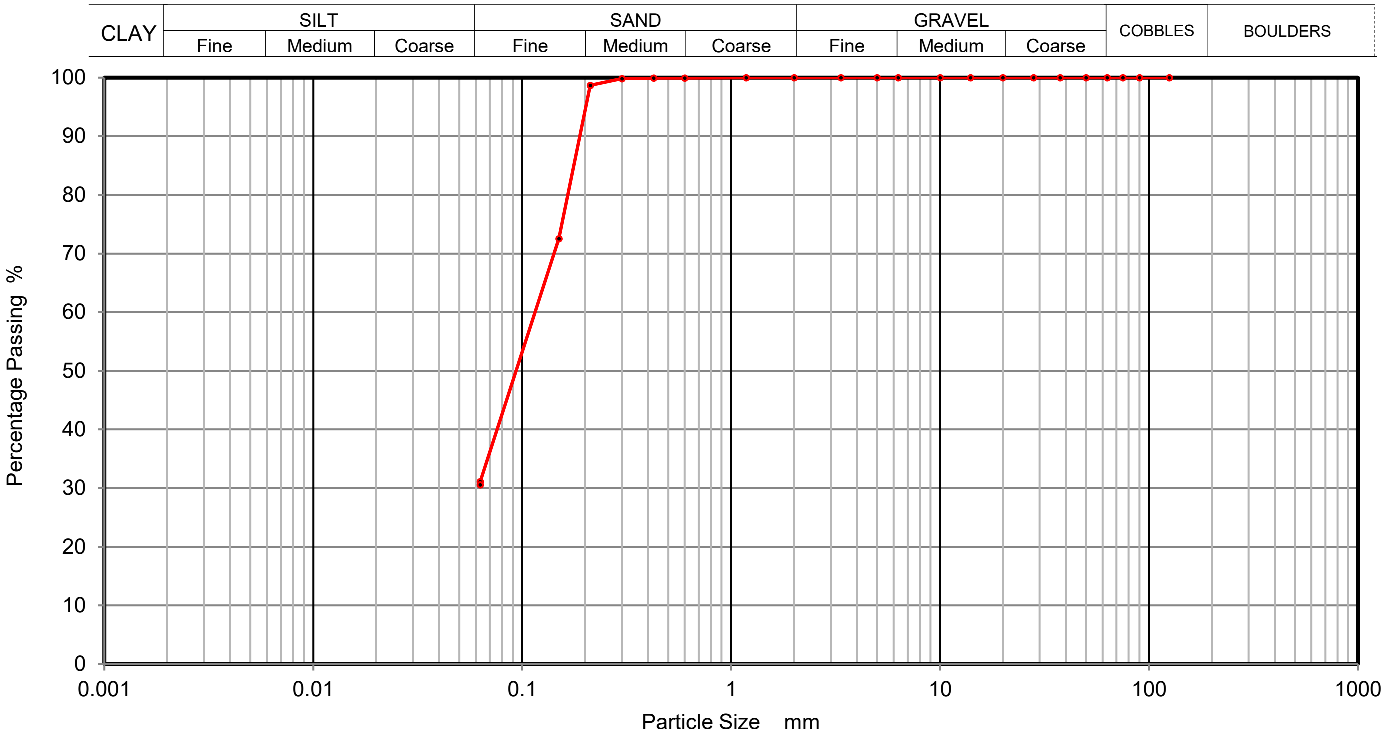
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**BH104**
Site Name	**Otterpool Park**	Sample No.	**1**
Soil Description	Brown silty clayey fine to medium SAND.	Depth Top	**4.00**
		Depth Base	**5.00**
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	73		
0.063	31		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	69
Silt and Clay	31

Grading Analysis	
Uniformity Coefficient	

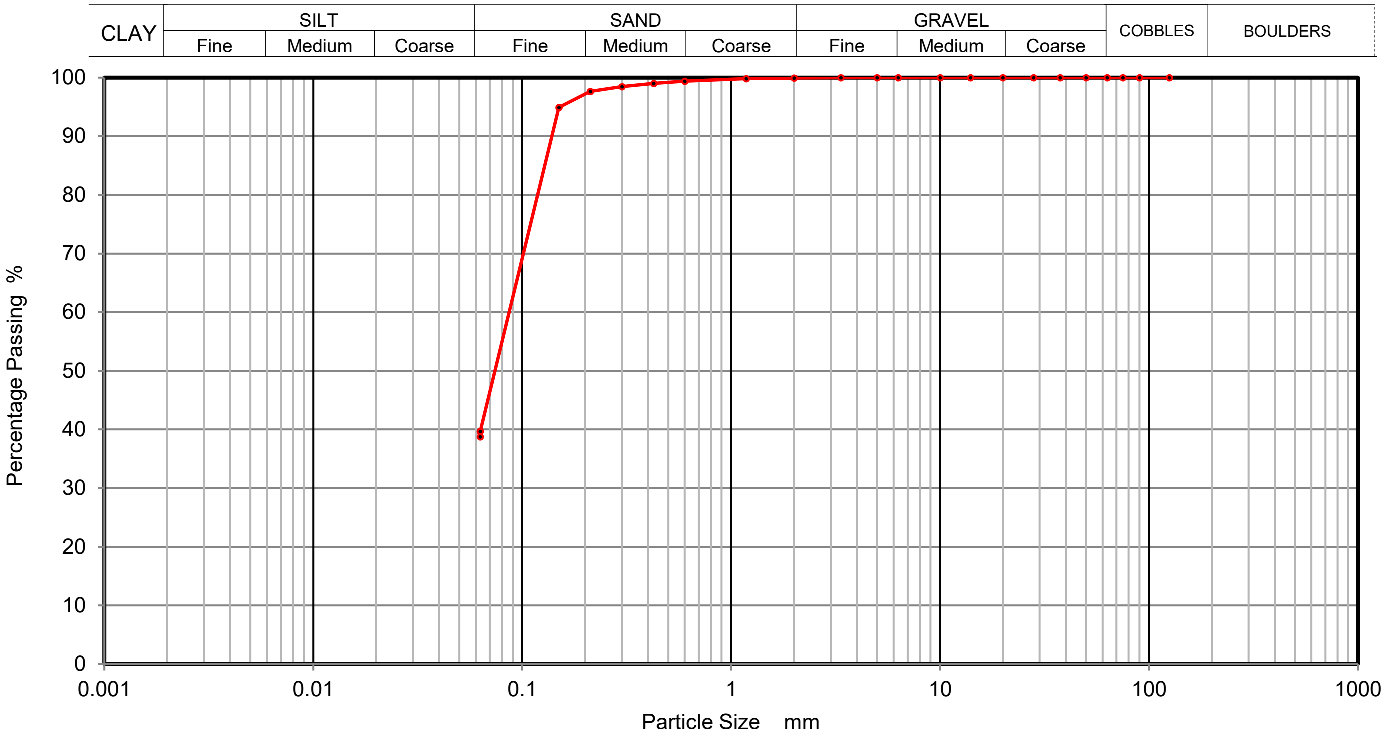
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**BH105**
Site Name	**Otterpool Park**	Sample No.	**12**
Soil Description	Grey silty clayey fine to coarse SAND.	Depth Top	**5.00**
		Depth Base	
		Sample Type	**D**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	98		
0.212	98		
0.15	95		
0.063	40		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	60
Silt and Clay	40

Grading Analysis	
Uniformity Coefficient	

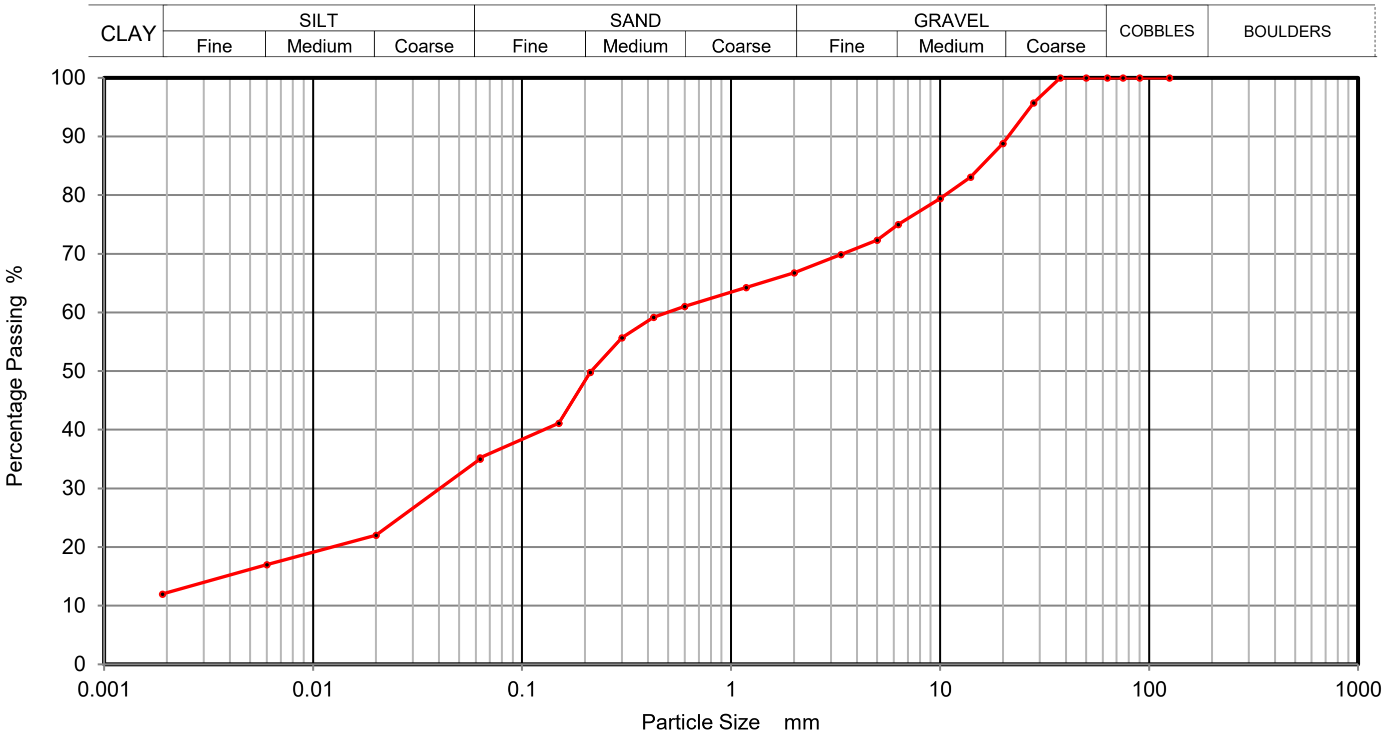
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	**36503**
		Borehole/Pit No.	**TP101**
Site Name	**Otterpool Park**	Sample No.	**10**
Soil Description	Brown clayey silty fine to coarse sandy fine to coarse GRAVEL.	Depth Top	**1.50**
		Depth Base	
		Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	22
90	100	0.0060	17
75	100	0.0019	12
63	100		
50	100		
37.5	100		
28	96		
20	89		
14	83		
10	79		
6.3	75		
5	72		
3.35	70		
2	67		
1.18	64		
0.6	61		
0.425	59		
0.3	56		
0.212	50		
0.15	41		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	33
Sand	32
Silt	23
Clay	12

Grading Analysis	
Uniformity Coefficient	

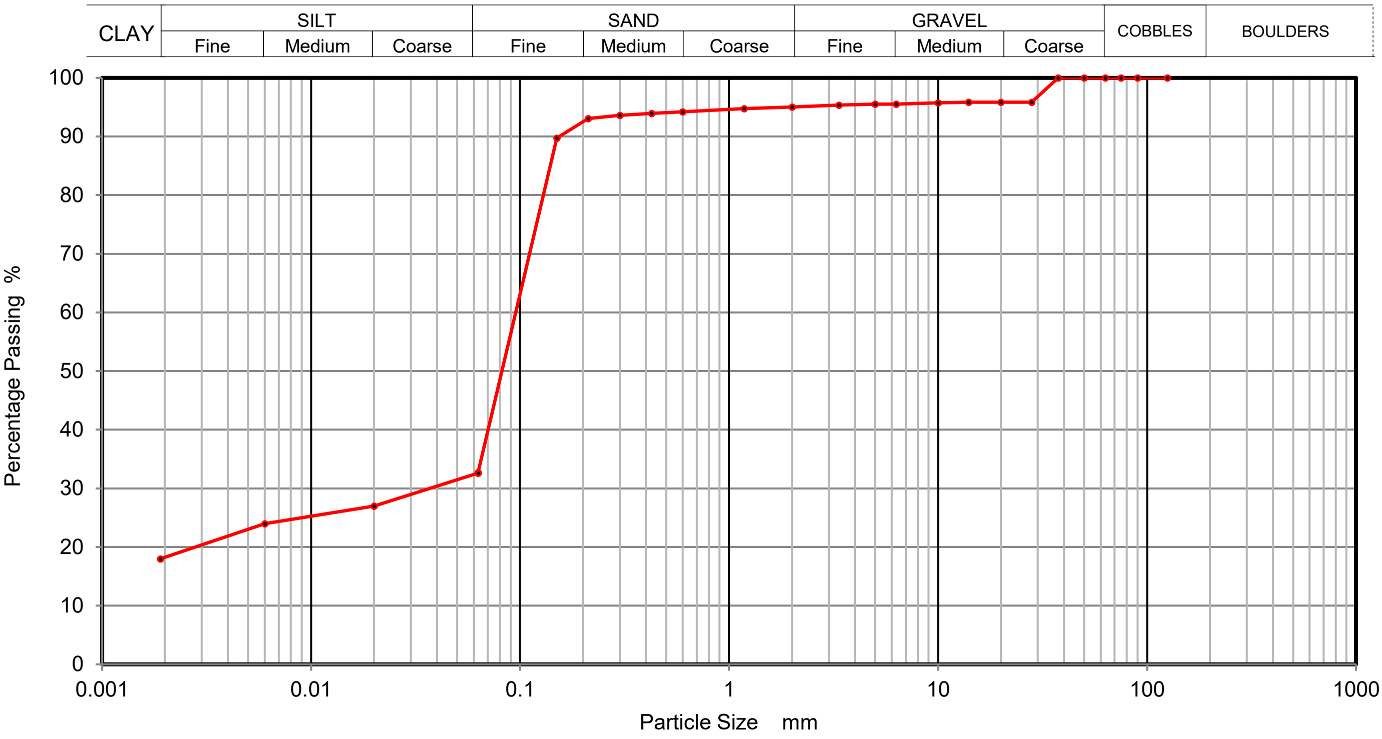
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	**36503**
		Borehole/Pit No.	**TP103**
Site Name	**Otterpool Park**	Sample No.	**10**
Soil Description	Brown slightly fine to coarse gravelly silty clayey fine to coarse SAND.	Depth Top	**1.50**
		Depth Base	
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	27
90	100	0.0060	24
75	100	0.0019	18
63	100		
50	100		
37.5	100		
28	96		
20	96		
14	96		
10	96		
6.3	96		
5	96		
3.35	95		
2	95		
1.18	95		
0.6	94		
0.425	94		
0.3	94		
0.212	93		
0.15	90		
0.063	33		

Sample Proportions	% dry mass
Cobbles	0
Gravel	5
Sand	62
Silt	15
Clay	18

Grading Analysis	
Uniformity Coefficient	

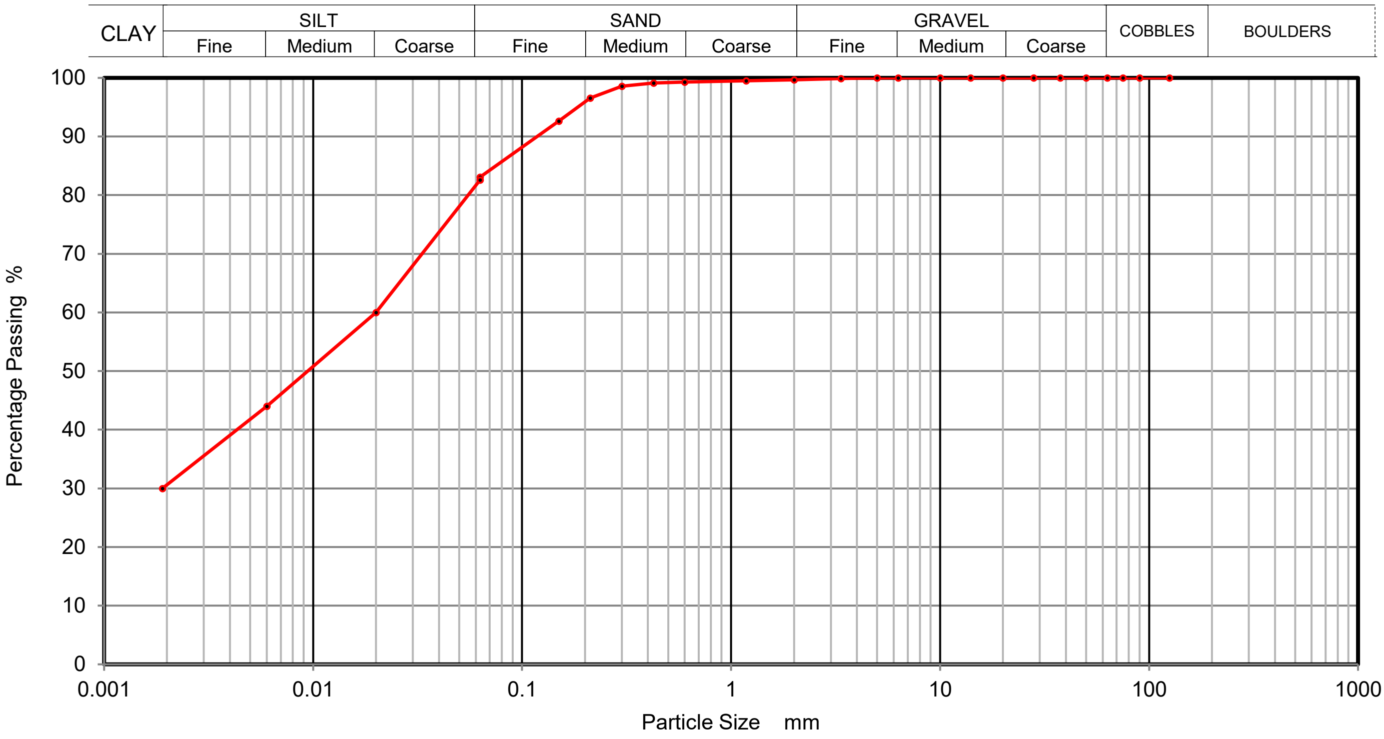
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	DP Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	**36503**
		Borehole/Pit No.	**TP104**
Site Name	**Otterpool Park**	Sample No.	**10**
Soil Description	Brown fine to coarse sandy clayey SILT.	Depth Top	**1.50**
		Depth Base	
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	60
90	100	0.0060	44
75	100	0.0019	30
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	99		
0.3	99		
0.212	97		
0.15	93		
0.063	83		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	17
Silt	53
Clay	30

Grading Analysis	
Uniformity Coefficient	

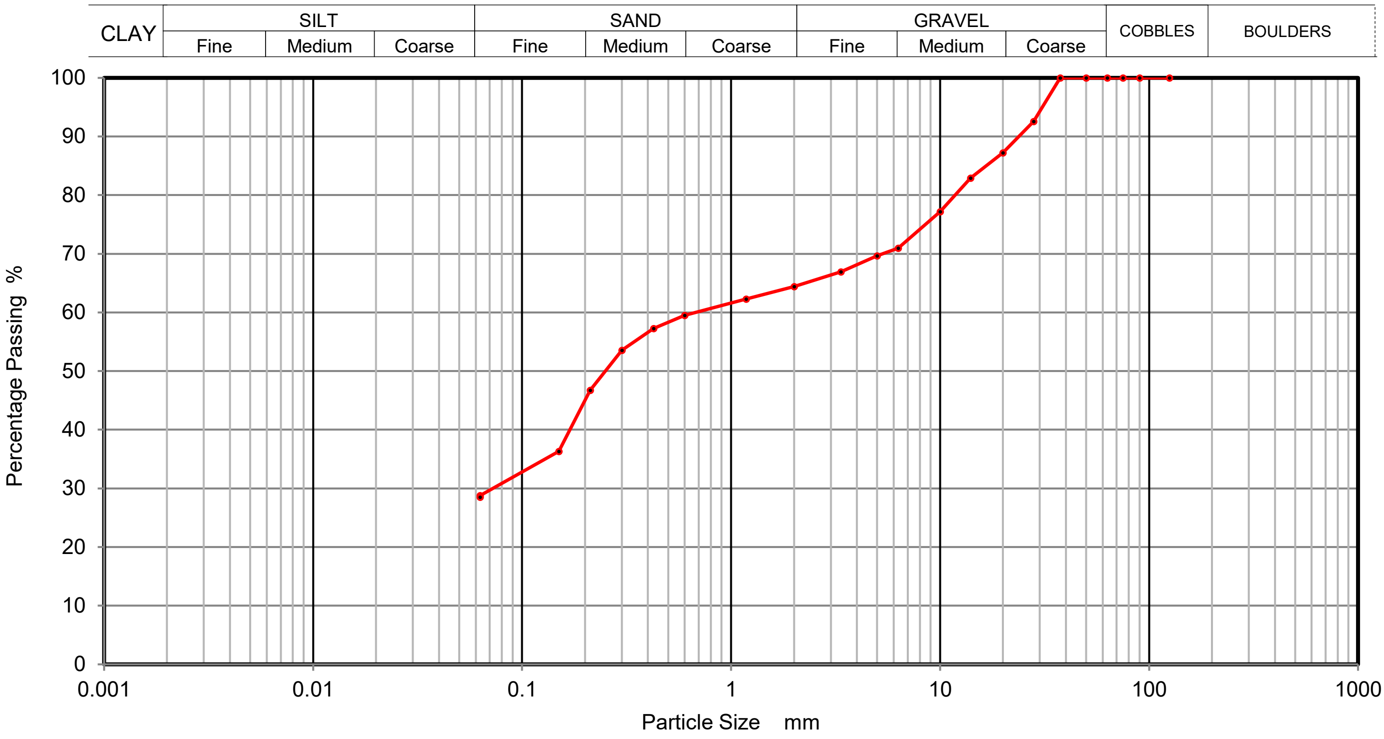
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING
2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	36503
		Borehole/Pit No.	TP105
Site Name	Otterpool Park	Sample No.	4
Soil Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL.	Depth Top	2.20
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	93		
20	87		
14	83		
10	77		
6.3	71		
5	70		
3.35	67		
2	64		
1.18	62		
0.6	59		
0.425	57		
0.3	54		
0.212	47		
0.15	36		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	36
Sand	35
Silt and Clay	29

Grading Analysis	
Uniformity Coefficient	

Remarks

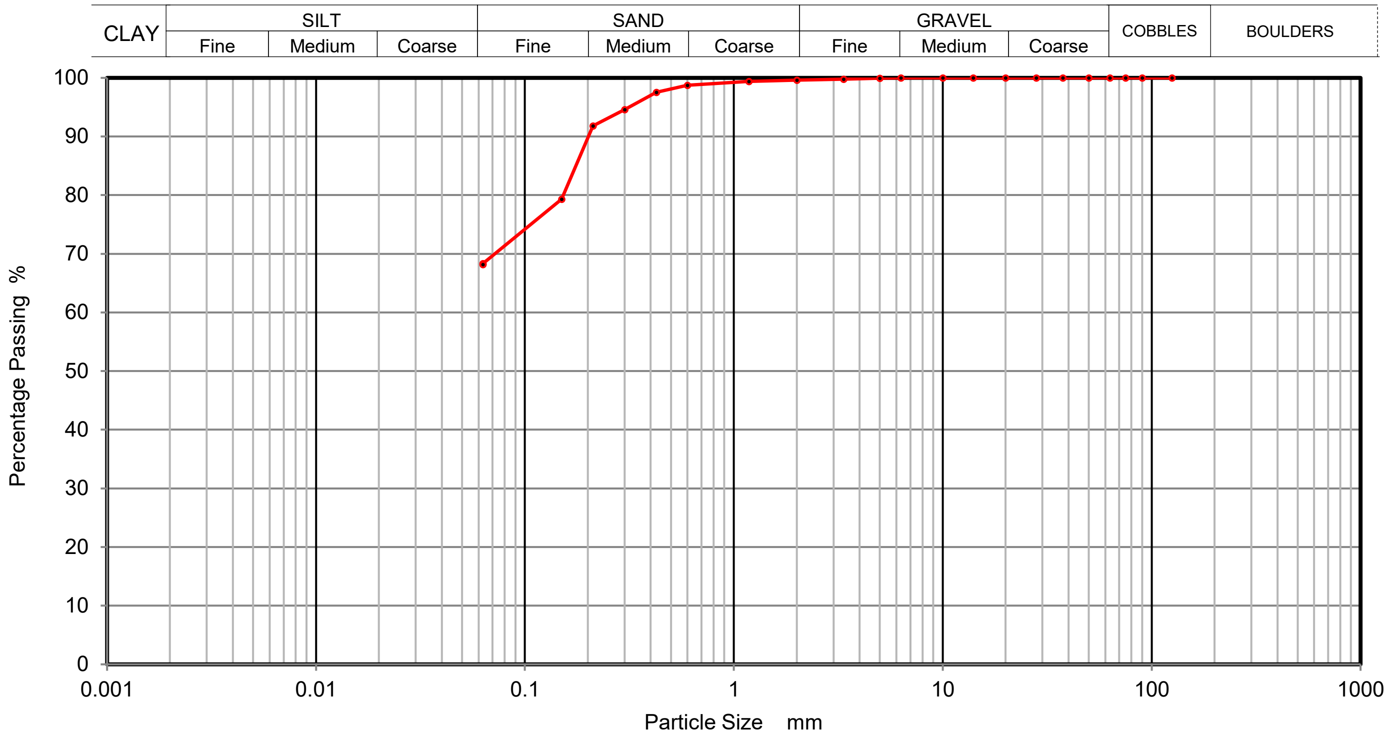
Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

		Contract Number	**36503**
		Borehole/Pit No.	**TP108**
Site Name	**Otterpool Park**	Sample No.	**1**
Soil Description	Brown fine to coarse sandy SILT/CLAY.	Depth Top	**1.50**
		Depth Base	
		Sample Type	**D**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	98		
0.3	95		
0.212	92		
0.15	79		
0.063	68		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	32
Silt and Clay	68

Grading Analysis	
Uniformity Coefficient	

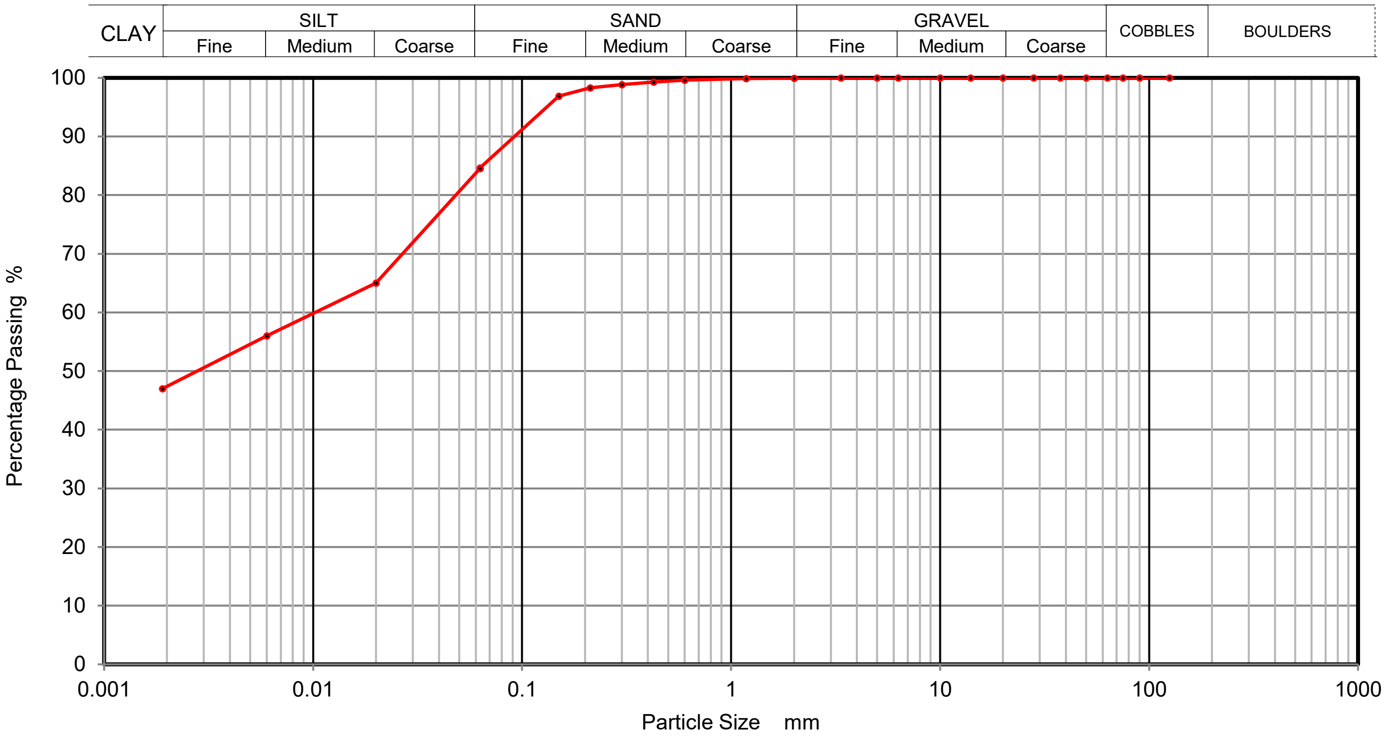
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	**36503**
		Borehole/Pit No.	**TP109**
Site Name	**Otterpool Park**	Sample No.	**7**
Soil Description	Brown fine to medium sandy silty CLAY.	Depth Top	**1.20**
		Depth Base	
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	65
90	100	0.0060	56
75	100	0.0019	47
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	98		
0.15	97		
0.063	85		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	15
Silt	38
Clay	47

Grading Analysis	
Uniformity Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

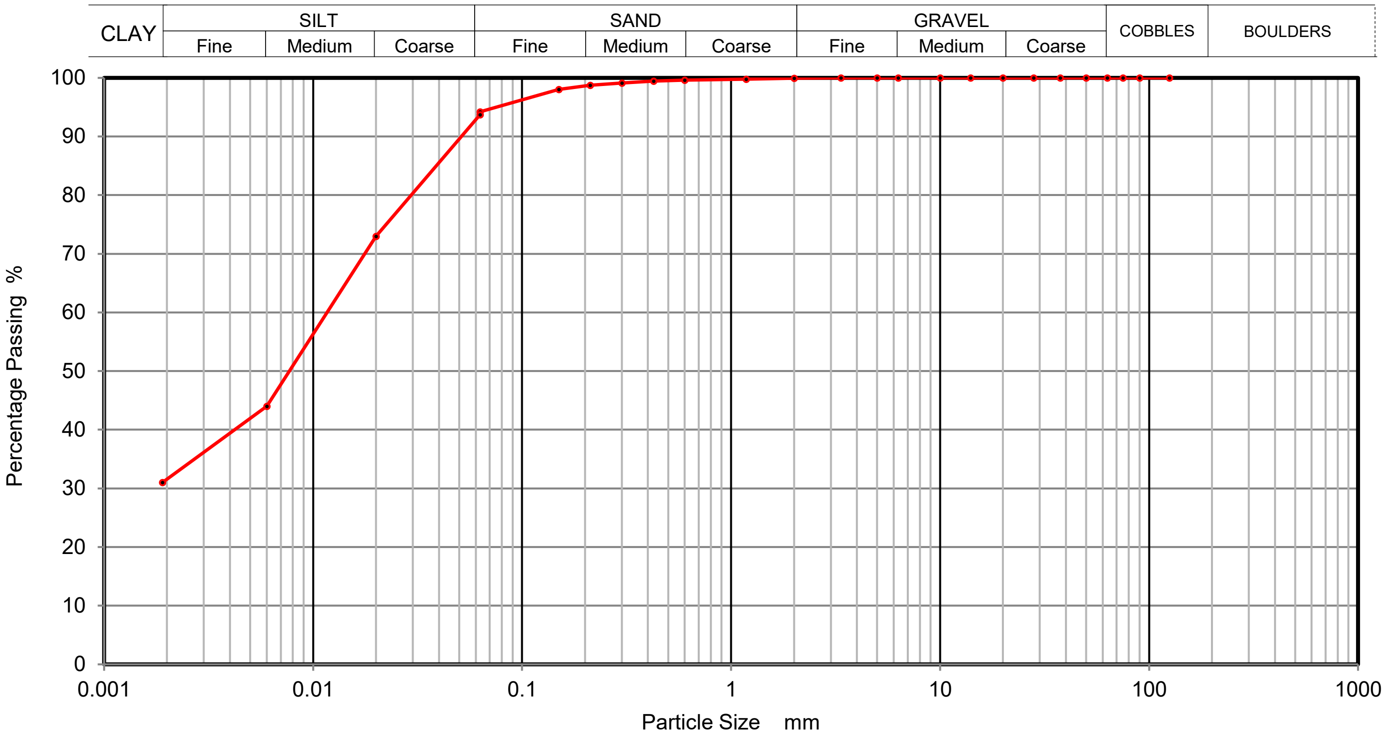
Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	P Evans

UKAS
TESTING
2788

GSTL

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

		Contract Number	**36503**
		Borehole/Pit No.	**TP110**
Site Name	**Otterpool Park**	Sample No.	**7**
Soil Description	Brown slightly fine to medium sandy clayey SILT.	Depth Top	**1.00**
		Depth Base	
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	73
90	100	0.0060	44
75	100	0.0019	31
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.212	99		
0.15	98		
0.063	94		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	6
Silt	63
Clay	31

Grading Analysis	
Uniformity Coefficient	

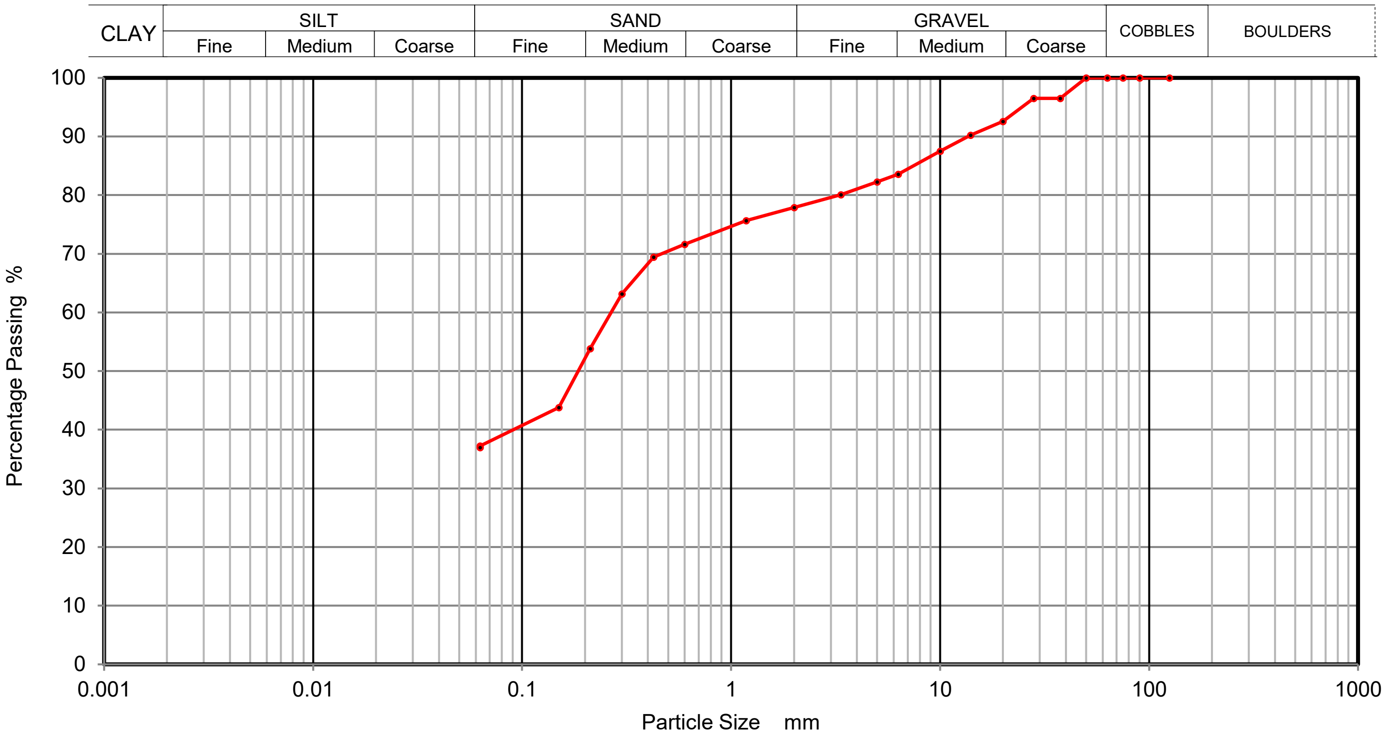
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	DP Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**TP112**
Site Name	**Otterpool Park**	Sample No.	**7**
Soil Description	Brown fine to coarse gravelly silty clayey fine to coarse SAND.	Depth Top	**1.00**
		Depth Base	
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	97		
28	97		
20	93		
14	90		
10	87		
6.3	84		
5	82		
3.35	80		
2	78		
1.18	76		
0.6	72		
0.425	69		
0.3	63		
0.212	54		
0.15	44		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	41
Silt and Clay	37

Grading Analysis	
Uniformity Coefficient	

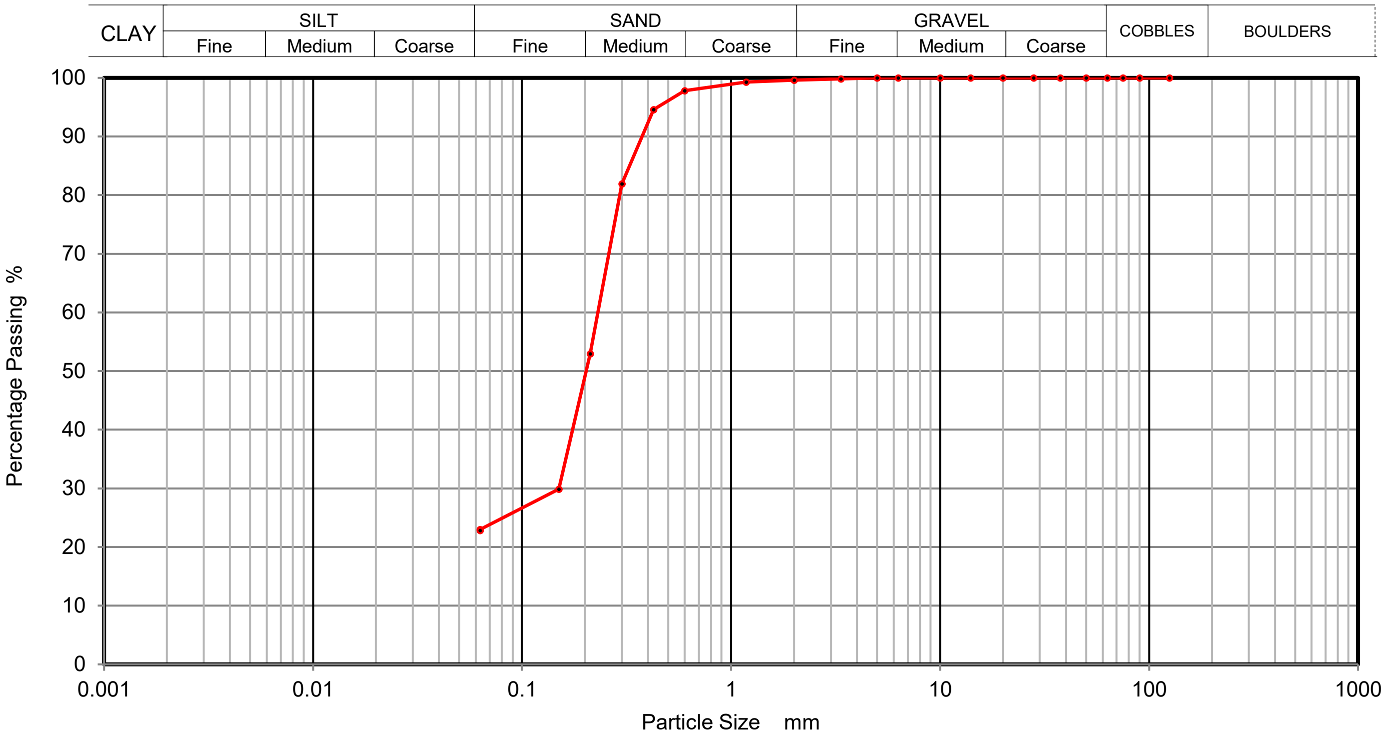
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	**36503**
		Borehole/Pit No.	**WS101**
Site Name	**Otterpool Park**	Sample No.	**13**
Soil Description	Brown silty clayey fine to coarse SAND.	Depth Top	**2.00**
		Depth Base	**2.80**
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	98		
0.425	95		
0.3	82		
0.212	53		
0.15	30		
0.063	23		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	77
Silt and Clay	23

Grading Analysis	
Uniformity Coefficient	

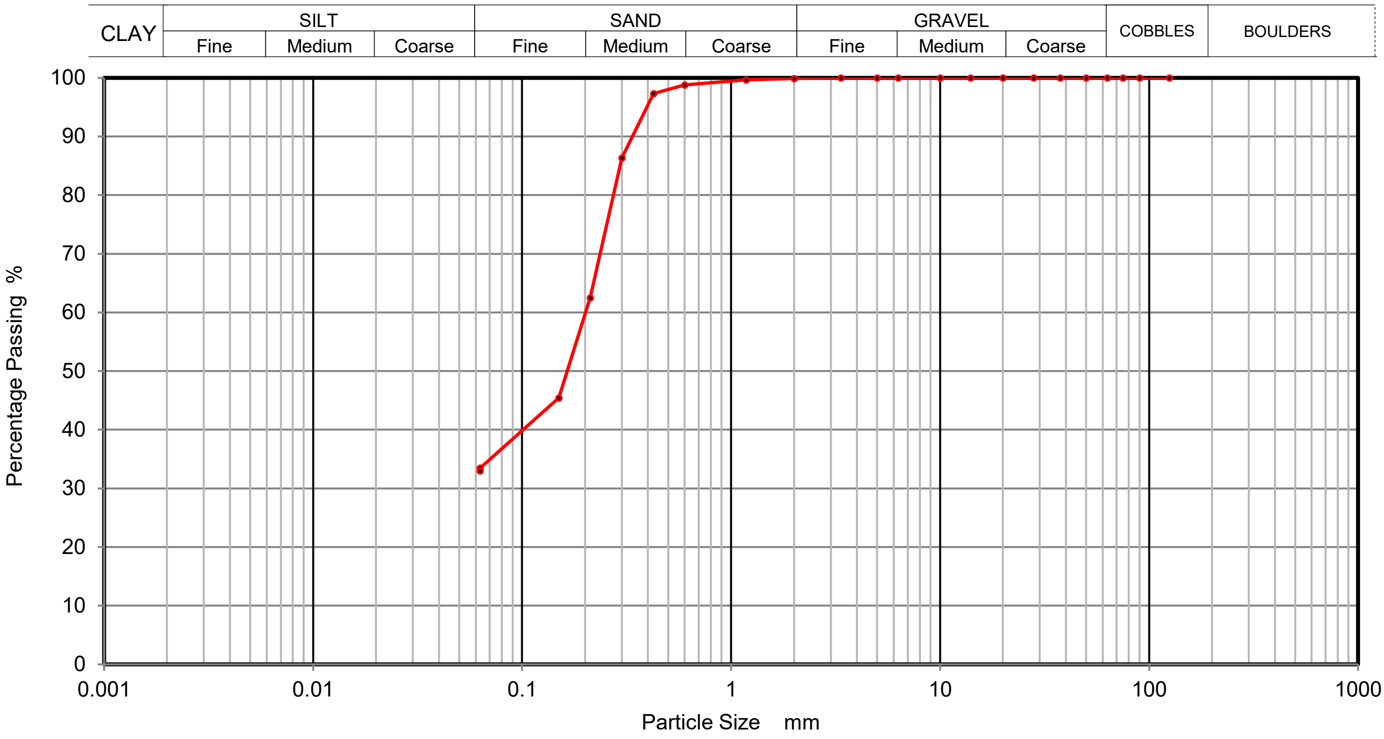
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**WS103**
Site Name	**Otterpool Park**	Sample No.	**16**
Soil Description	Brown silty clayey fine to coarse SAND.	Depth Top	**2.00**
		Depth Base	**2.80**
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	97		
0.3	86		
0.212	63		
0.15	45		
0.063	33		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	67
Silt and Clay	33

Grading Analysis	
Uniformity Coefficient	

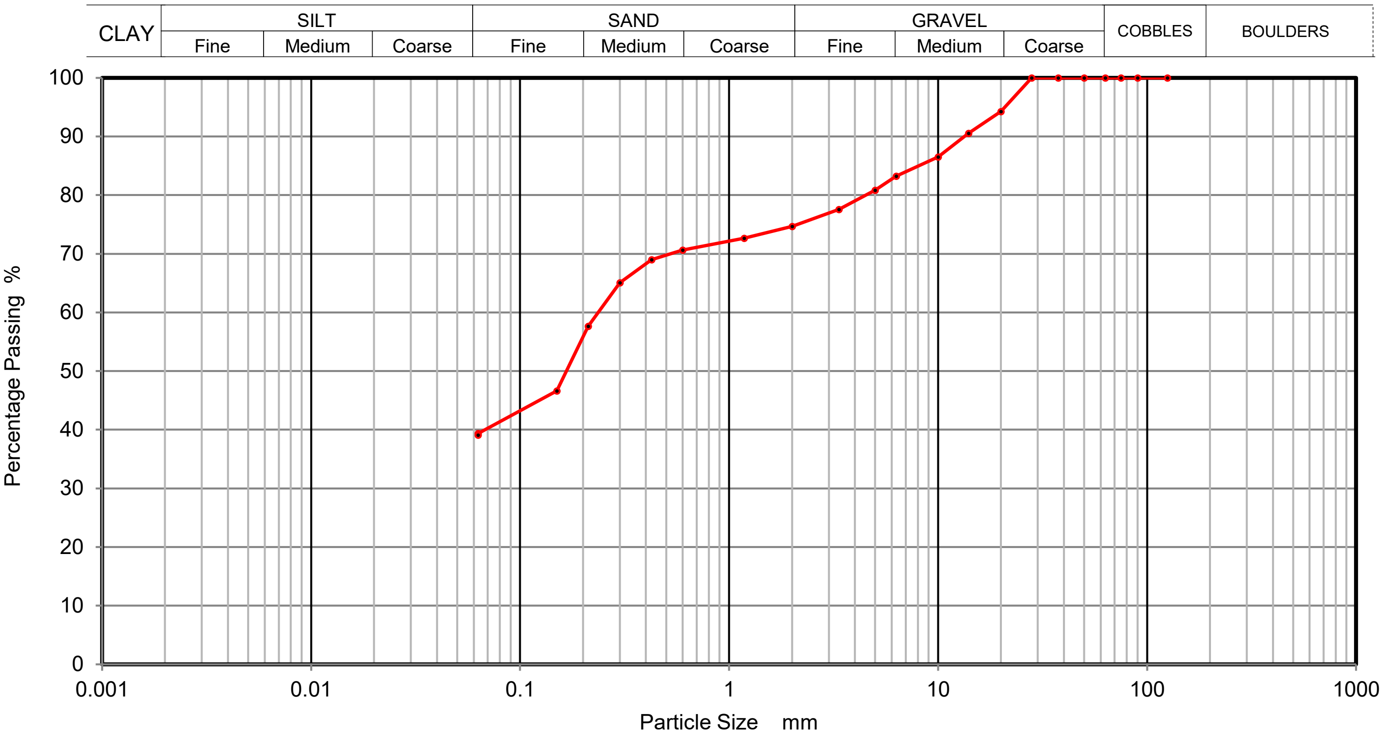
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**WS104C**
Site Name	**Otterpool Park**	Sample No.	**16**
Soil Description	Brown fine to coarse gravelly fine to coarse sandy SILT/CLAY.	Depth Top	**3.00**
		Depth Base	**3.90**
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	94		
14	91		
10	87		
6.3	83		
5	81		
3.35	78		
2	75		
1.18	73		
0.6	71		
0.425	69		
0.3	65		
0.212	58		
0.15	47		
0.063	39		

Sample Proportions	% dry mass
Cobbles	0
Gravel	25
Sand	36
Silt and Clay	39

Grading Analysis	
Uniformity Coefficient	

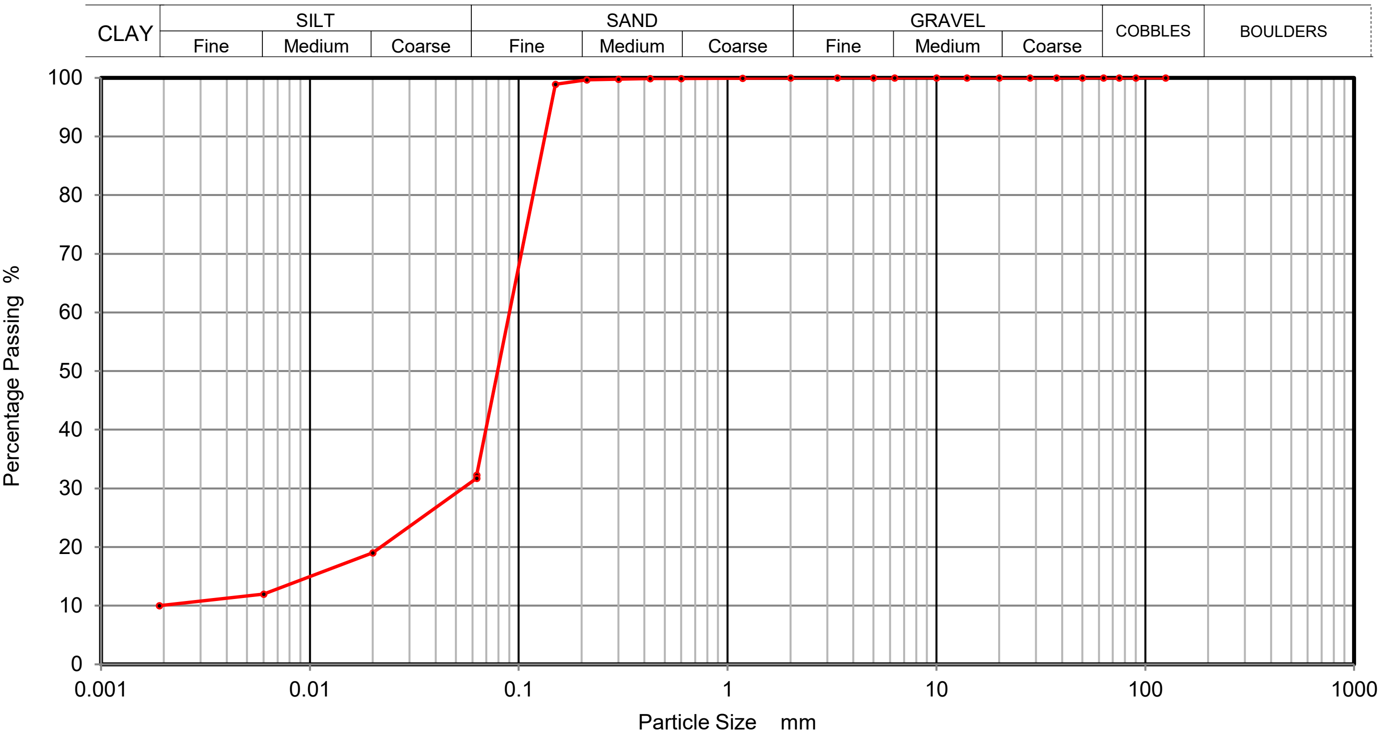
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**	Contract Number	**36503**
		Borehole/Pit No.	**WS105**
Site Name	**Otterpool Park**	Sample No.	**12**
Soil Description	Brown silty clayey fine SAND.	Depth Top	**2.00**
		Depth Base	**2.25**
		Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	19
90	100	0.0060	12
75	100	0.0019	10
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	99		
0.063	32		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	68
Silt	22
Clay	10

Grading Analysis	
Uniformity Coefficient	

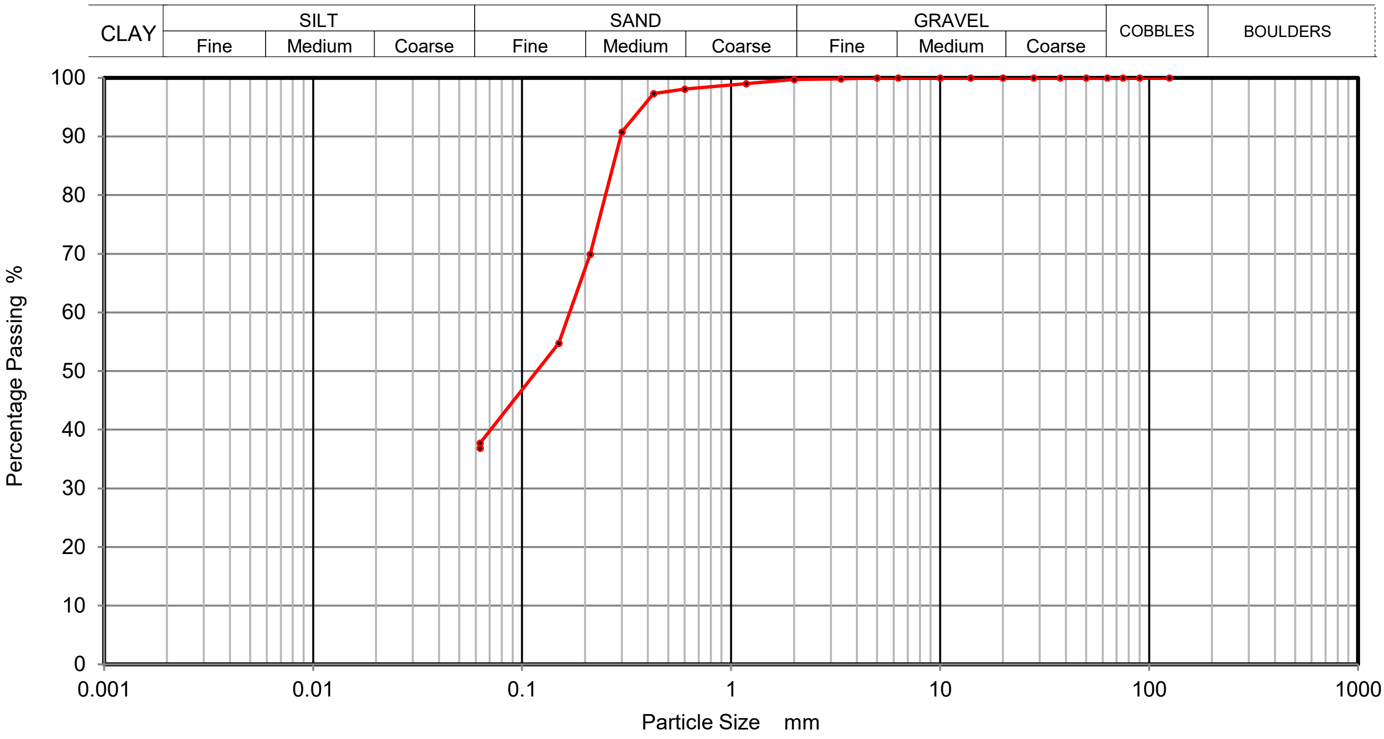
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	P Evans

UKAS TESTING 2788

GSTL	**PARTICLE SIZE DISTRIBUTION** **BS 1377 Part 2:1990** **Wet Sieve, Clause 9.2**	Contract Number	**36503**
		Borehole/Pit No.	**WS112**
Site Name	**Otterpool Park**	Sample No.	**14**
Soil Description	Brown silty clayey fine to coarse SAND.	Depth Top	**2.20**
		Depth Base	**2.70**
		Sample Type	**B**



Sieving		**Sedimentation**	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	98		
0.425	97		
0.3	91		
0.212	70		
0.15	55		
0.063	38		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	62
Silt and Clay	38

Grading Analysis	
Uniformity Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	26-09-17	Ben Sharp	
RO/MH	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**Certificate of Chemical Analysis** **(BRE BR 279)**	**Contract Number**	36503
		Client Reference	UA008926
Client	Arcadis	**Date Received**	21-09-17
Site Name	Otterpool Park	**Date Started**	
		Date Completed	27-09-17
		No. of Samples	11

Hole Number	Sample Number	Sample Type	Depth (m)			Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	Ph Value	Total Sulphur	Magnesium	Nitrate
BH101	4	B	0.75	-	1.00	0.33	0.15	NCP	6.78	0.12	<1	<10
BH104	2	B	7.00	-	8.00	0.29	0.03	NCP	6.92	0.11	<1	10-25
				-								
TP102	7	B	1.10	-		0.29	0.04	NCP	6.39	0.10	<1	<10
TP103	3	D	1.50	-		0.25	0.08	NCP	6.16	0.10	<1	<10
TP104	8	D	1.00	-		0.25	0.03	NCP	6.84	0.09	<1	10-25
TP110	7	B	1.00	-		0.21	0.03	NCP	6.56	0.09	<1	10-25
TP113	10	B	1.40	-		0.23	0.03	NCP	6.89	0.09	<1	<10
WS103	16	B	2.00	-	2.80	0.21	0.02	NCP	5.89	0.08	<1	<10
WS107	7	B	0.70	-	1.00	0.23	0.07	NCP	6.60	0.08	<1	<10
WS109	8	B	1.20	-	1.80	0.25	0.03	NCP	6.24	0.09	<1	<10
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Key	**Reported As**
Acid Soluble Sulphate	% SO_4
Aqueous Extract Sulphate	g/l SO_4
Chloride Content (Semi)	mg Cl/l
PH Value	@ 25°
Total Sulphur	% S
Magnesium	g/l SO_4
Nitrate	NO_3 mg/l

Remarks

NCP = No Chloride Present

Test Operator	Checked and Authorised by		Ben Sharp	
Neil Edwards	Date	27-09-17		

GSTL	**Certificate of Chemical Analysis (BRE BR 279)**	**Contract Number**	36503
		Client Reference	UA008926
Client	Arcadis	**Date Received**	
Site Name	Otterpool Park	**Date Started**	
		Date Completed	29-09-17
		No. of Samples	2

Hole Number	Sample Number	Sample Type	Depth (m)			Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	Ph Value	Total Sulphur	Magnesium	Nitrate
TP108	5	D	0.60	-		0.25	0.03	NCP	6.71	0.09	<1	<10
TP111	10	B	1.60	-		0.23	0.02	NCP	6.82	0.09	<1	<10
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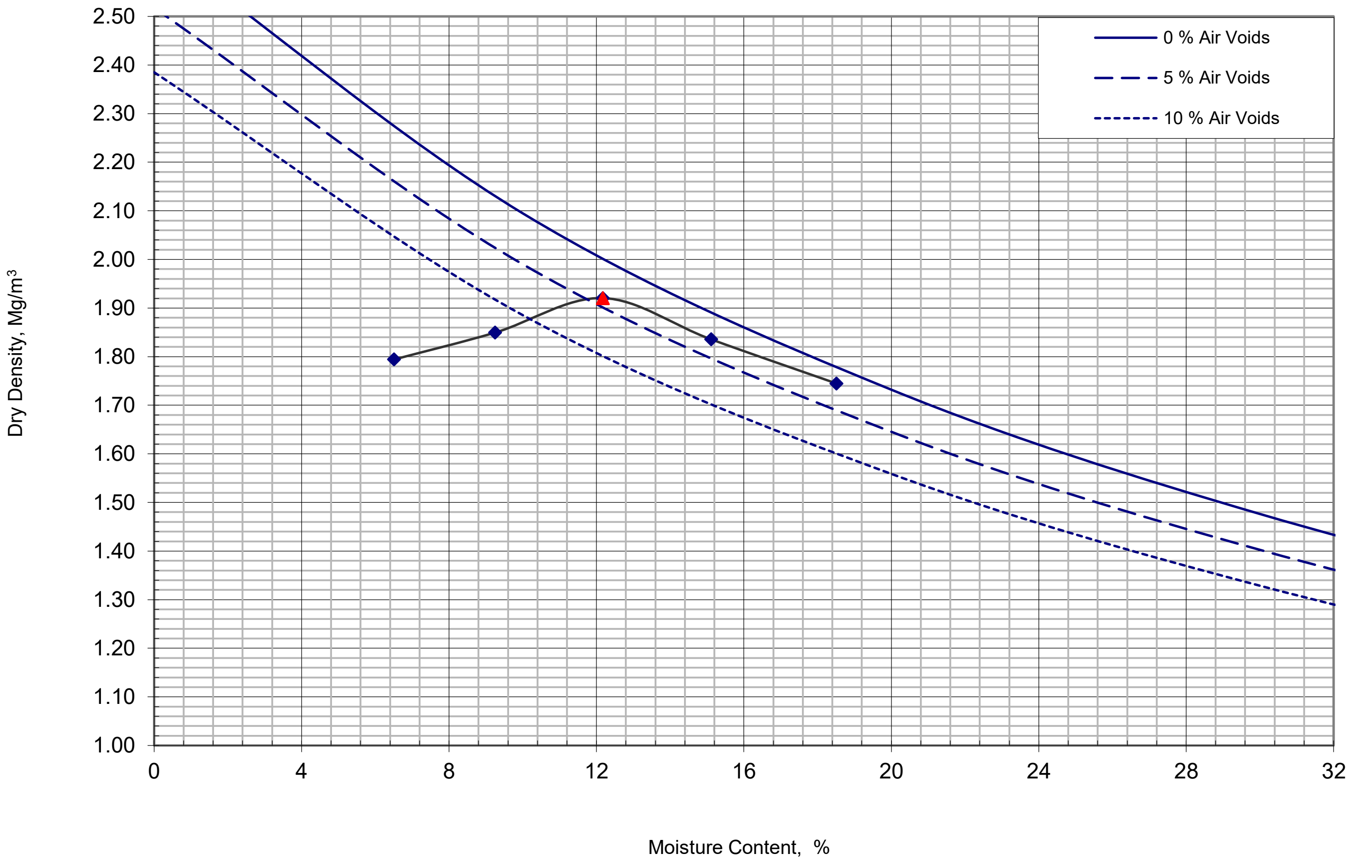
Key	**Reported As**
Acid Soluble Sulphate	% SO_4
Aqueous Extract Sulphate	g/l SO_4
Chloride Content (Semi)	mg Cl/l
PH Value	@ 25°
Total Sulphur	% S
Magnesium	g/l SO_4
Nitrate	NO_3 mg/l

Remarks

NCP = No Chloride Present

Test Operator	Checked and Authorised by		Ben Sharp	
Darren Bourne	Date	29-09-17		

GSTL	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	**36503**
		Borehole / Pit No	**TP101**
Site Name	**Otterpool Park**	Sample No	**4**
		Depth Top	**0.50**
Compaction Method	**2.5 Kg Rammer**	Depth Base	
Compaction Clause	**BS1377:Part 4:1990, Clause 3.4**	Sample Type	**B**



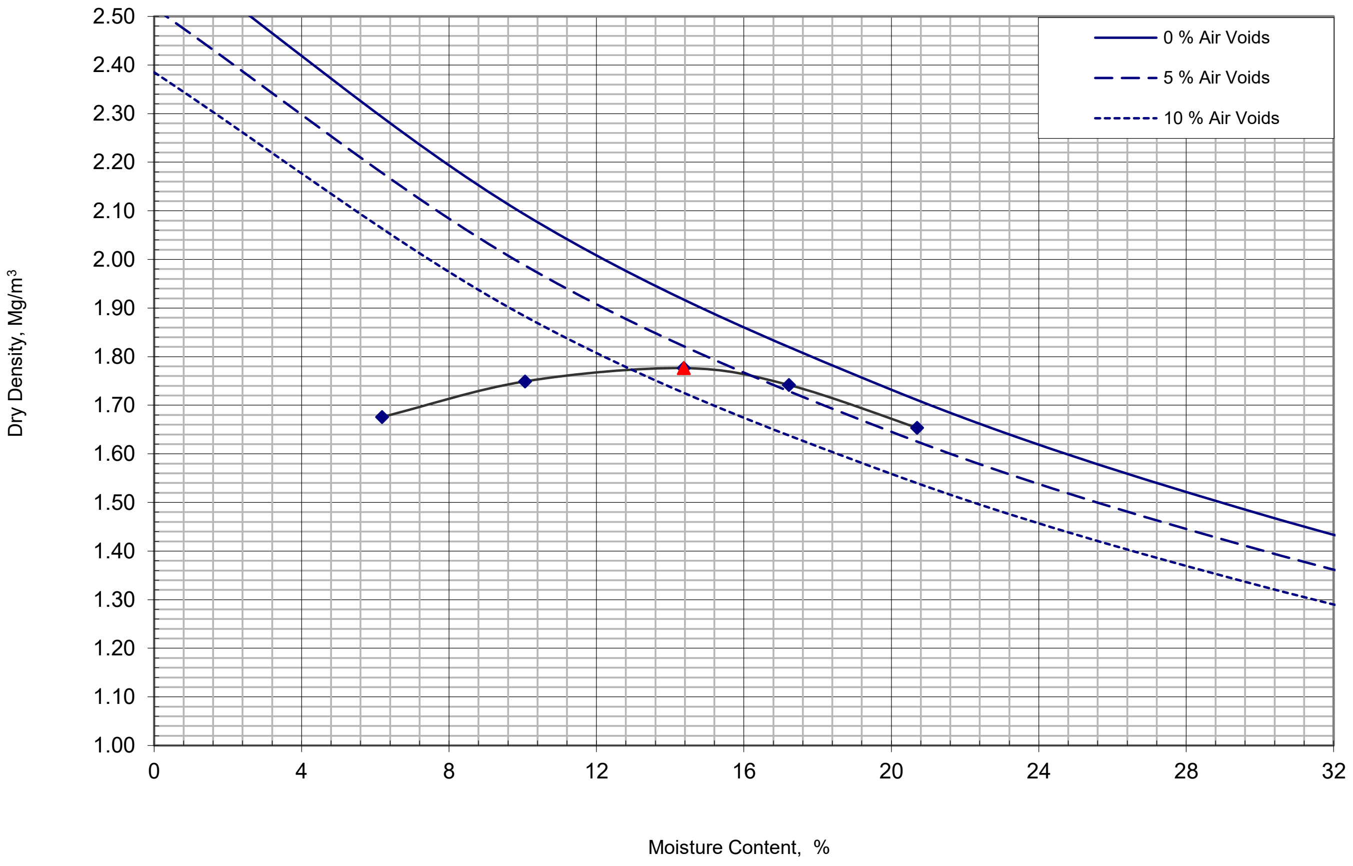
Compaction Point	1	2	3	4	5							
Moisture Content	6.5	9.3	12	15	19							
Bulk Density	1.91	2.02	2.15	2.11	2.07							
Dry Density	1.79	1.85	1.92	1.84	1.74							

Initial Moisture Content	19	%
Maximum Dry Density	1.92	Mg/m3
Optimum Moisture Content	12	%
Paricle Density	2.65 Assumed	Mg/m3
Material Retianed 37.5mm	0	%
Material Retianed 20mm	0	%

Operators	Checked	28-09-17	Ben Sharp	
CA	Approved	29-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	**36503**
		Borehole / Pit No	**TP104**
Site Name	**Otterpool Park**	Sample No	**2**
		Depth Top	**2.20**
Compaction Method	**2.5 Kg Rammer**	Depth Base	
Compaction Clause	**BS1377:Part 4:1990, Clause 3.4**	Sample Type	**B**



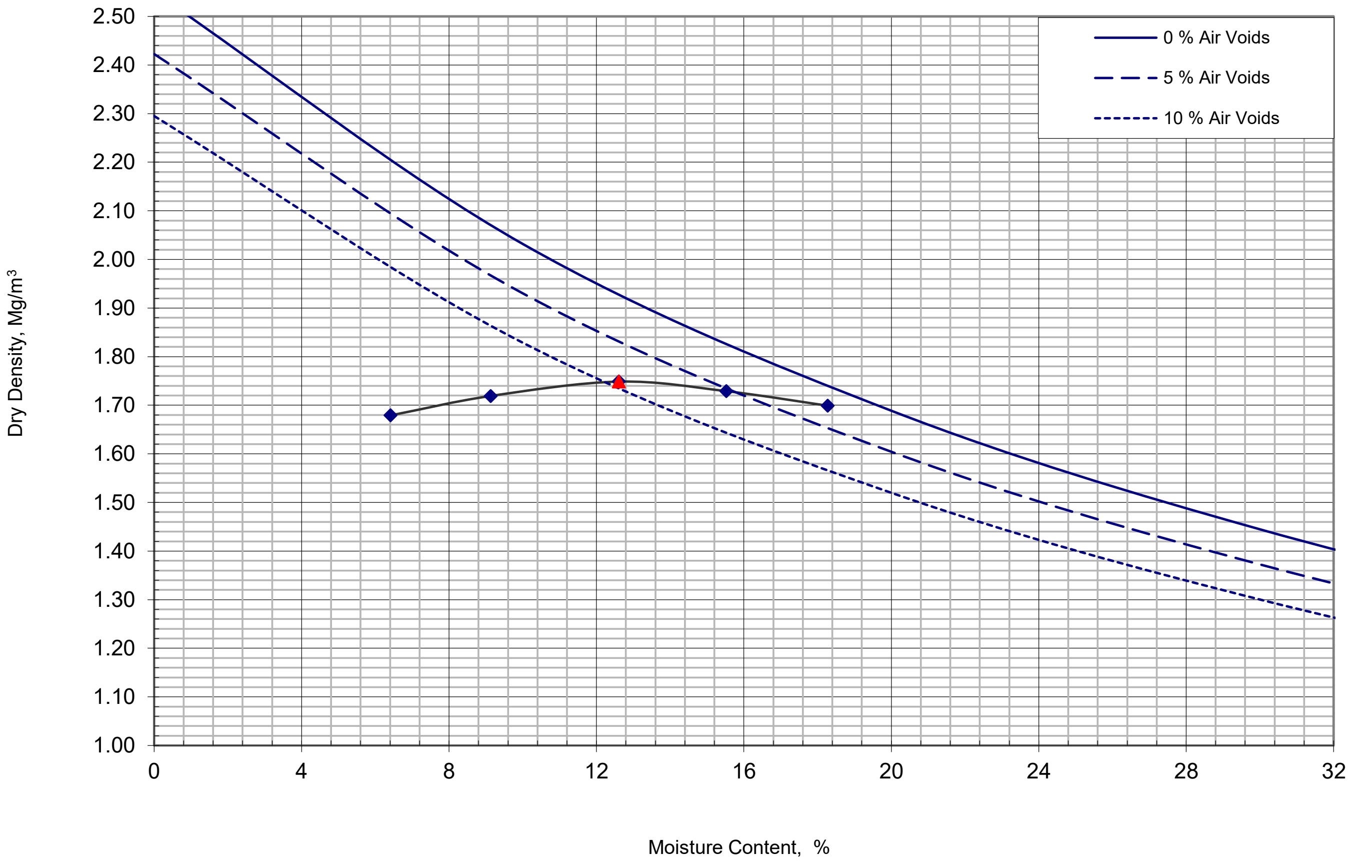
Compaction Point	1	2	3	4	5							
Moisture Content	6.2	10	14	17	21							
Bulk Density	1.78	1.93	2.03	2.04	2.00							
Dry Density	1.68	1.75	1.78	1.74	1.65							

Initial Moisture Content	21	%
Maximum Dry Density	1.78	Mg/m3
Optimum Moisture Content	14	%
Paricle Density	2.65 Assumed	Mg/m3
Material Retianed 37.5mm	0	%
Material Retianed 20mm	0	%

Operators	Checked	28-09-17	Ben Sharp	
CA	Approved	29-09-17	Paul Evans	D P Evans

UKAS TESTING
2788

GSTL	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	**36503**
		Borehole / Pit No	**TP106**
Site Name	**Otterpool Park**	Sample No	**2**
		Depth Top	**2.00**
Compaction Method	**2.5 Kg Rammer**	Depth Base	
Compaction Clause	**BS1377:Part 4:1990, Clause 3.4**	Sample Type	**B**



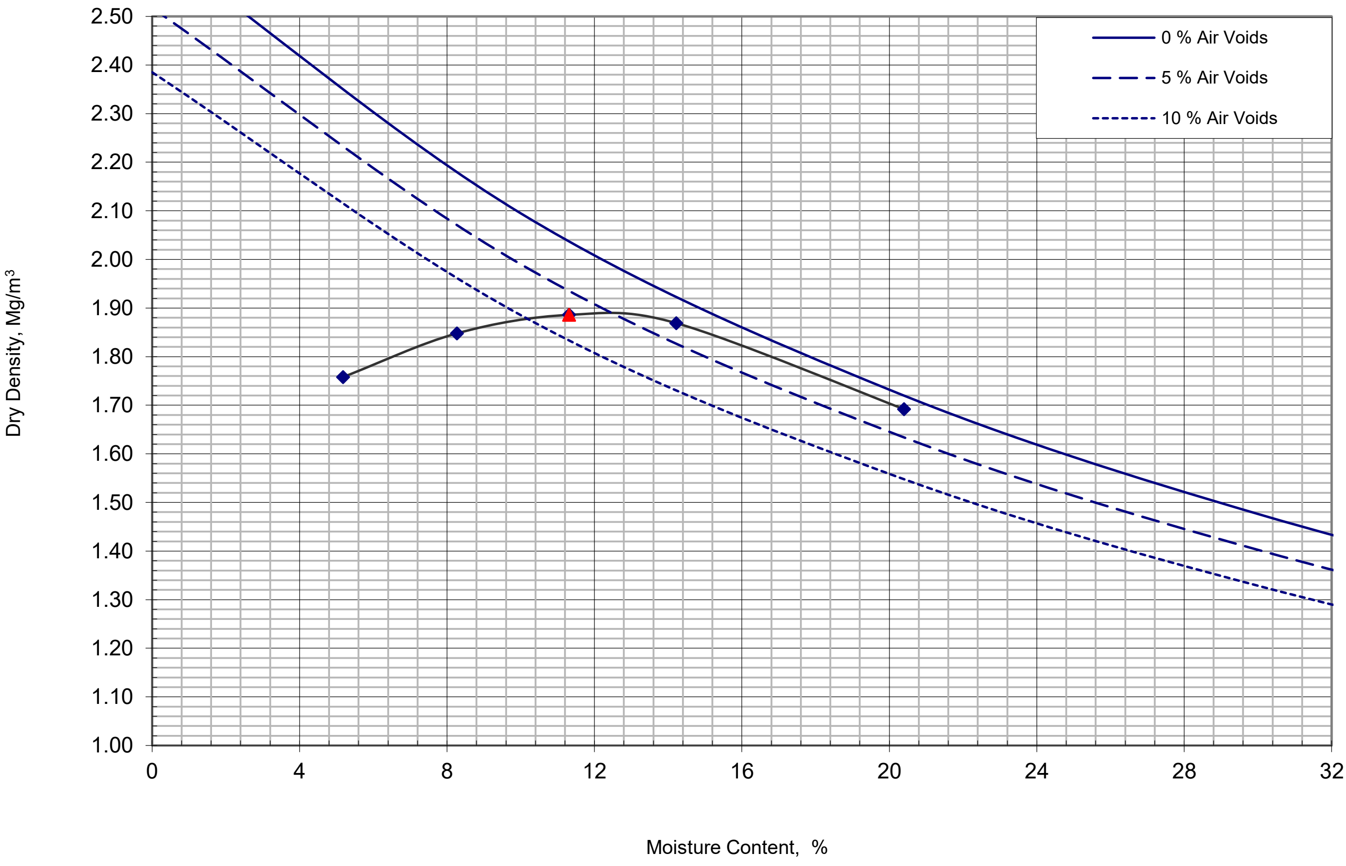
Compaction Point	1	2	3	4	5							
Moisture Content	6.4	9.1	13	16	18							
Bulk Density	1.79	1.88	1.97	2.00	2.01							
Dry Density	1.68	1.72	1.75	1.73	1.70							

Initial Moisture Content	13	%
Maximum Dry Density	1.75	Mg/m3
Optimum Moisture Content	13	%
Paricle Density	2.55 Assumed	Mg/m3
Material Retianed 37.5mm	19	%
Material Retianed 20mm	32	%

Operators	Checked	26-09-17	Ben Sharp	
CA	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number Borehole / Pit No	36503 TP109
Site Name	**Otterpool Park**	Sample No	**7**
		Depth Top	**1.20**
Compaction Method	**2.5 Kg Rammer**	Depth Base	
Compaction Clause	**BS1377:Part 4:1990, Clause 3.4**	Sample Type	**B**



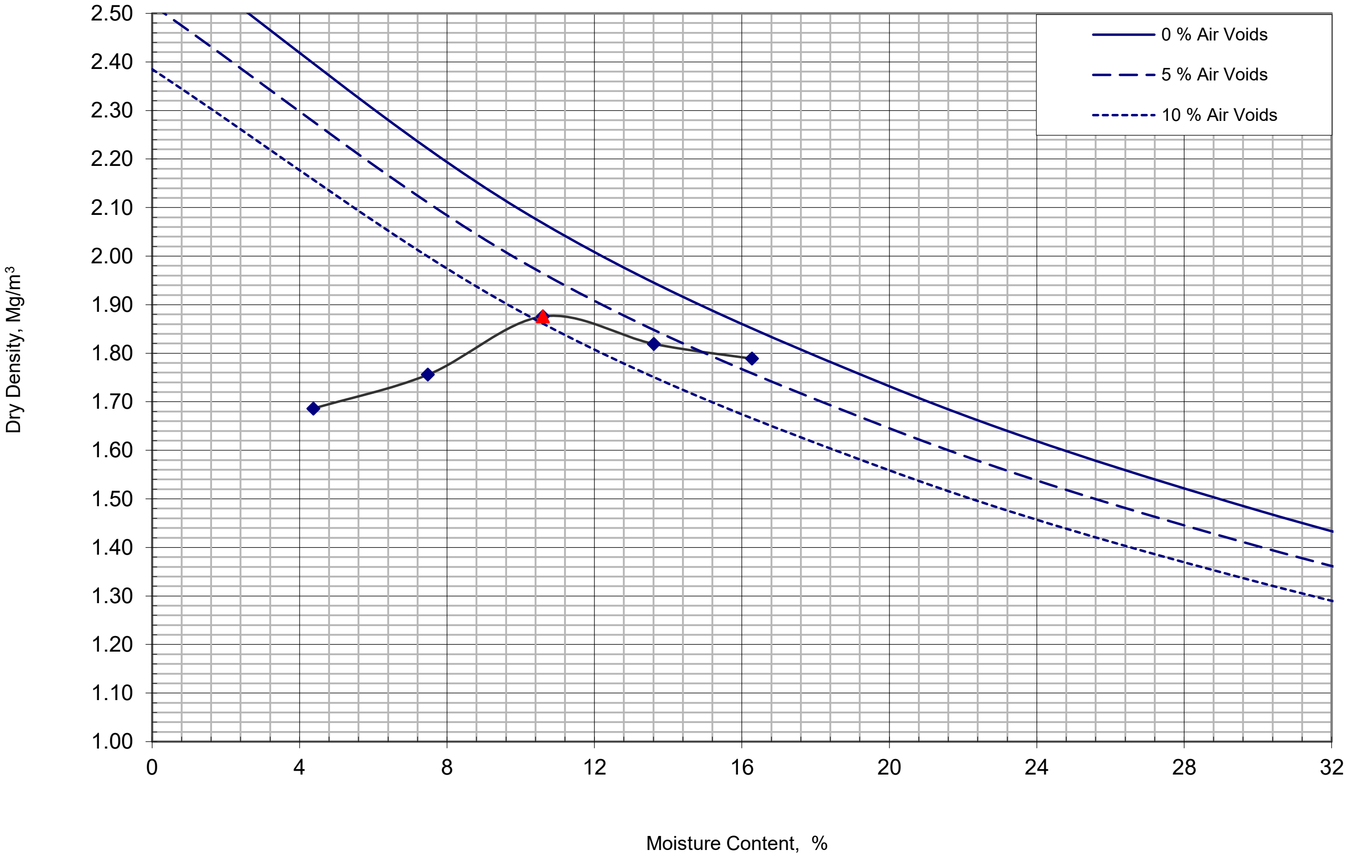
Compaction Point	1	2	3	4	5							
Moisture Content	5.2	8.3	11	14	20							
Bulk Density	1.85	2.00	2.10	2.13	2.04							
Dry Density	1.76	1.85	1.89	1.87	1.69							

Initial Moisture Content	20	%
Maximum Dry Density	1.89	Mg/m3
Optimum Moisture Content	11	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	26-09-17	Ben Sharp	
CA	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

GSTL	Dry Density / Moisture Content Relationship BS 1377:Part 4:1990	Contract Number	36503
		Borehole / Pit No	TP110
Site Name	**Otterpool Park**	Sample No	7
		Depth Top	1.00
Compaction Method	**2.5 Kg Rammer**	Depth Base	
Compaction Clause	**BS1377:Part 4:1990, Clause 3.4**	Sample Type	B



Compaction Point	1	2	3	4	5							
Moisture Content	4.4	7.5	11	14	16							
Bulk Density	1.76	1.89	2.07	2.07	2.08							
Dry Density	1.69	1.76	1.88	1.82	1.79							

Initial Moisture Content	11	%
Maximum Dry Density	1.88	Mg/m3
Optimum Moisture Content	11	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	26-09-17	Ben Sharp	
CA	Approved	27-09-17	Paul Evans	D P Evans

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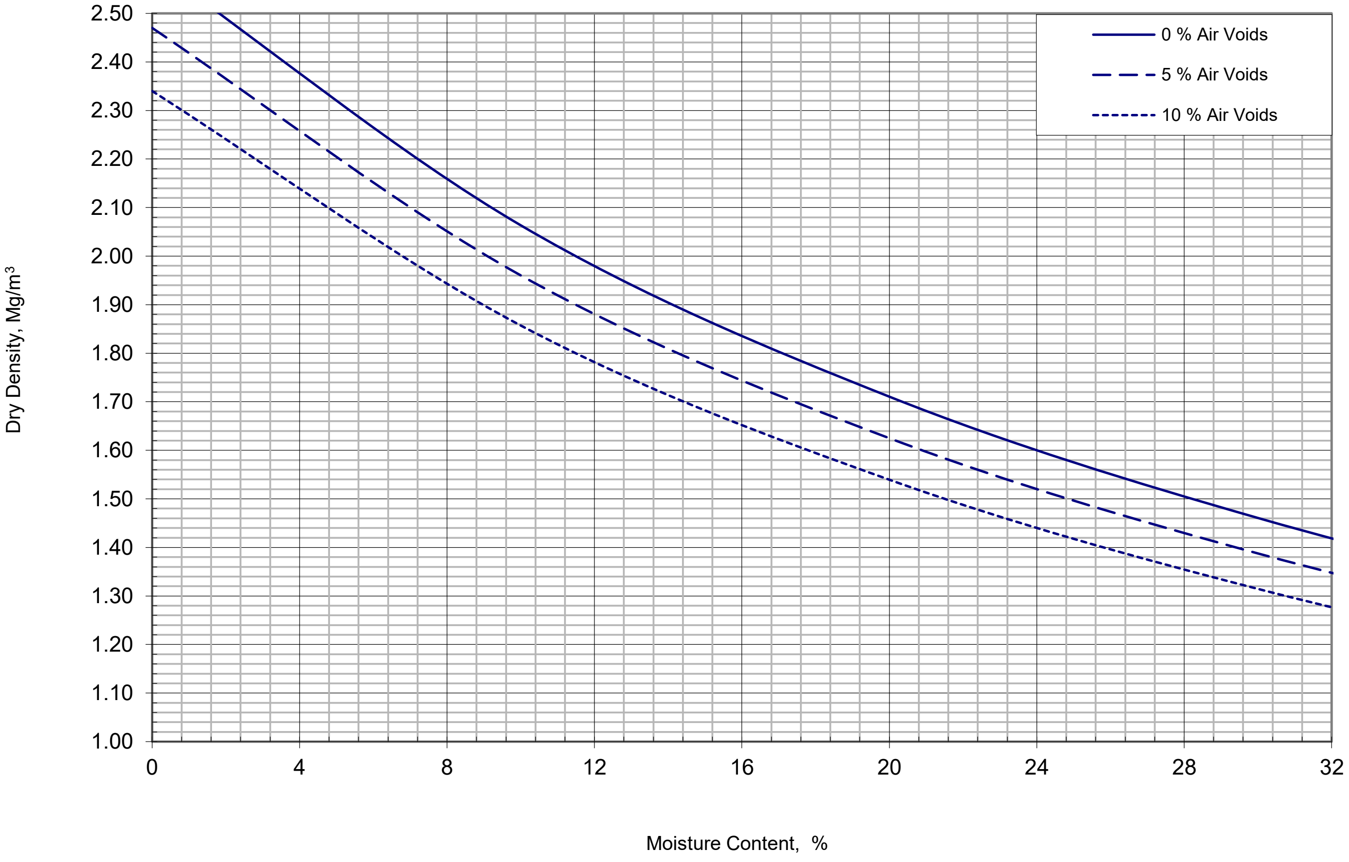
GSTL	**Dry Density / Moisture Content Relationship** **BS 1377:Part 4:1990**	Contract Number	**36503**
		Borehole / Pit No	**TP112**
Site Name	**Otterpool Park**	Sample No	**7**
		Depth Top	**1.00**
Compaction Method	**2.5 Kg Rammer**	Depth Base	**1.50**
Compaction Clause	**BS1377:Part 4:1990, Clause 3.3**	Sample Type	**B**



Compaction Point	1	2	3	4	5							
Moisture Content	6.5	9.5	12	16	19							
Bulk Density	0.79	0.84	0.89	0.90	0.90							
Dry Density	0.75	0.77	0.79	0.78	0.76							

Initial Moisture Content	12	%
Maximum Dry Density	0.79	Mg/m3
Optimum Moisture Content	12	%
Particle Density	2.6 Assumed	Mg/m3
Material Retained 37.5mm	3	%
Material Retained 20mm	4	%

Operators	Checked	26-09-17	Ben Sharp	
CA	Approved	27-09-17	Paul Evans	D P Evans

UKAS TESTING 2788

APPENDIX G

GEO-ENVIRONMENTAL LABORATORY TEST DATA

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WD18 8YS

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e: reception@i2analytical.com

Analytical Report Number : 17-58392

Project / Site name:	Otterpool	**Samples received on:**	21/08/2017
Your job number:	UA008926	**Samples instructed on:**	23/08/2017
Your order number:		**Analysis completed by:**	01/09/2017
Report Issue Number:	1	**Report issued on:**	01/09/2017
Samples Analysed:	21 soil samples		

Signed: [redacted]

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 17-58392

Project / Site name: Otterpool

Lab Sample Number				805231	805232	805233	805234	805235
Sample Reference				TP101	TP102	TP104	TP106	TP108
Sample Number				3	3	6	3	9
Depth (m)				0.20	0.30	0.50	0.20	1.00
Date Sampled				15/08/2017	15/08/2017	16/08/2017	22/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	20
Moisture Content	%	N/A	NONE	13	11	10	15	7.9
Total mass of sample received	kg	0.001	NONE	1.4	1.7	1.5	1.4	1.6
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.6	6.3	6.8	6.1	6.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0050	0.0045	0.0043	0.015	0.0058
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.012	0.012	0.0023	0.020	0.0013
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	13	14	9.2	9.9
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.8	0.5	0.9	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	19	24	14	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	14	13	16	8.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	24	12	38	8.9
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	33	10	26	5.1	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	41	42	28	30

Lab Sample Number				805231	805232	805233	805234	805235
Sample Reference				TP101	TP102	TP104	TP106	TP108
Sample Number				3	3	6	3	9
Depth (m)				0.20	0.30	0.50	0.20	1.00
Date Sampled				15/08/2017	15/08/2017	16/08/2017	22/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10

Analytical Report Number: 17-58392

Project / Site name: Otterpool

Lab Sample Number				805231	805232	805233	805234	805235
Sample Reference				TP101	TP102	TP104	TP106	TP108
Sample Number				3	3	6	3	9
Depth (m)				0.20	0.30	0.50	0.20	1.00
Date Sampled				15/08/2017	15/08/2017	16/08/2017	22/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Analytical Report Number: 17-58392

Project / Site name: Otterpool

Lab Sample Number				805231	805232	805233	805234	805235
Sample Reference				TP101	TP102	TP104	TP106	TP108
Sample Number				3	3	6	3	9
Depth (m)				0.20	0.30	0.50	0.20	1.00
Date Sampled				15/08/2017	15/08/2017	16/08/2017	22/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
VOC % Match	%	N/A	NONE	-	-	-	-	-

Lab Sample Number				805231	805232	805233	805234	805235
Sample Reference				TP101	TP102	TP104	TP106	TP108
Sample Number				3	3	6	3	9
Depth (m)				0.20	0.30	0.50	0.20	1.00
Date Sampled				15/08/2017	15/08/2017	16/08/2017	22/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Project / Site name: Otterpool

Lab Sample Number				805231	805232	805233	805234	805235
Sample Reference				TP101	TP102	TP104	TP106	TP108
Sample Number				3	3	6	3	9
Depth (m)				0.20	0.30	0.50	0.20	1.00
Date Sampled				15/08/2017	15/08/2017	16/08/2017	22/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs TICs								
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-

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Project / Site name: Otterpool

Lab Sample Number				805236	805237	805238	805239	805240
Sample Reference				TP109	TP110	TP113	TP113	TP113
Sample Number				3	3	3	6	2
Depth (m)				0.30	0.30	0.30	0.60	1.40
Date Sampled				21/08/2017	22/08/2017	17/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	15	8.2	13	17
Total mass of sample received	kg	0.001	NONE	1.5	1.6	1.8	1.4	1.6
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.3	7.7	9.1	7.2	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0085	0.015	0.20	0.025	0.060
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.016	0.011	0.018	0.0037	0.0061
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.70	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.24	< 0.05	0.12
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27	< 0.05	0.14
Phenanthrene	mg/kg	0.05	MCERTS	0.20	0.09	4.2	< 0.05	1.2
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	< 0.05	0.29
Fluoranthene	mg/kg	0.05	MCERTS	0.85	0.26	16	< 0.05	1.6
Pyrene	mg/kg	0.05	MCERTS	0.78	0.27	16	< 0.05	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.57	0.15	12	< 0.05	0.67
Chrysene	mg/kg	0.05	MCERTS	0.45	0.21	9.1	< 0.05	0.64
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.60	0.15	12	< 0.05	0.48
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.53	0.22	16	< 0.05	0.57
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.73	0.24	19	< 0.05	0.67
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.42	0.13	11	< 0.05	0.36
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.12	< 0.05	3.1	< 0.05	0.08
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.48	0.15	12	< 0.05	0.40
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.73	1.87	133	< 0.80	8.54
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	8.9	8.3	12	11
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.0	1.0	0.9	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	21	30	20	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	14	36	11	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	47	17	44	15	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	14	29	22	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	46	470	36	44

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Project / Site name: Otterpool

Lab Sample Number				805236	805237	805238	805239	805240
Sample Reference				TP109	TP110	TP113	TP113	TP113
Sample Number				3	3	3	6	2
Depth (m)				0.30	0.30	0.30	0.60	1.40
Date Sampled				21/08/2017	22/08/2017	17/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	15	< 2.0	2.7
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	33	< 8.0	12
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	170	< 8.0	34
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	220	< 10	48
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.5	-	8.0	< 2.0	5.1
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	110	< 10	19
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	28	-	690	12	36
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	38	-	810	16	61

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Project / Site name: Otterpool

Lab Sample Number				805236	805237	805238	805239	805240
Sample Reference				TP109	TP110	TP113	TP113	TP113
Sample Number				3	3	3	6	2
Depth (m)				0.30	0.30	0.30	0.60	1.40
Date Sampled				21/08/2017	22/08/2017	17/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	-
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	-

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Project / Site name: Otterpool

Lab Sample Number				805236	805237	805238	805239	805240
Sample Reference				TP109	TP110	TP113	TP113	TP113
Sample Number				3	3	3	6	2
Depth (m)				0.30	0.30	0.30	0.60	1.40
Date Sampled				21/08/2017	22/08/2017	17/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	-	-	ND	-	-
VOC % Match	%	N/A	NONE	-	-	0	-	-

Lab Sample Number				805236	805237	805238	805239	805240
Sample Reference				TP109	TP110	TP113	TP113	TP113
Sample Number				3	3	3	6	2
Depth (m)				0.30	0.30	0.30	0.60	1.40
Date Sampled				21/08/2017	22/08/2017	17/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	0.09	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	0.70	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	0.24	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	0.27	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	4.2	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	1.5	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	0.5	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	0.5	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	16	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	16	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	12	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	9.1	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	12	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	16	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	19	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	11	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	3.1	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	12	-	-

Lab Sample Number				805236	805237	805238	805239	805240
Sample Reference				TP109	TP110	TP113	TP113	TP113
Sample Number				3	3	3	6	2
Depth (m)				0.30	0.30	0.30	0.60	1.40
Date Sampled				21/08/2017	22/08/2017	17/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs TICs								
SVOCs TICs Compound Name		N/A	NONE	-	-	Benzo[e]pyrene	-	-
SVOC % Match	%	N/A	NONE	-	-	98	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	9-Octadecenamide, (Z)-	-	-
SVOC % Match	%	N/A	NONE	-	-	97	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	3,4:9,10-Dibenzopyrene	-	-
SVOC % Match	%	N/A	NONE	-	-	97	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Dibenz(a,e)aceanthrylene	-	-
SVOC % Match	%	N/A	NONE	-	-	97	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	1,2:3,4-Dibenzopyrene	-	-
SVOC % Match	%	N/A	NONE	-	-	97	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Tetradecane	-	-
SVOC % Match	%	N/A	NONE	-	-	96	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Pyrene, 1-methyl-	-	-
SVOC % Match	%	N/A	NONE	-	-	96	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Benzo[g]pteridine-10(2H)-acetaldehyde, 3,4-dihydro-7,8-dimethyl-2,4-dioxo	-	-
SVOC % Match	%	N/A	NONE	-	-	96	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	Dibenzothiophene	-	-
SVOC % Match	%	N/A	NONE	-	-	95	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	1H-Cyclopropa[l]phenanthrene,1a,9b-dihydro-	-	-
SVOC % Match	%	N/A	NONE	-	-	95	-	-

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Project / Site name: Otterpool

Lab Sample Number				805241	805242	805243	805244	805245
Sample Reference				TP113	TP113	WS101	WS102A	WS104C
Sample Number				5	1	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	0.50-0.55	0.00-0.20	0.10-0.20
Date Sampled				17/08/2017	17/08/2017	16/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	30
Moisture Content	%	N/A	NONE	19	19	13	15	8.5
Total mass of sample received	kg	0.001	NONE	1.8	1.9	1.8	2.0	2.0

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	7.7	7.8	7.4	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.022	0.0077	0.0057	0.0083	0.0090
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0044	< 0.0010	0.012	0.022	0.020

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.10	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.17	< 0.05	0.10
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.36	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.32	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.9	< 0.05	0.44
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	< 0.05	0.16
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	7.1	< 0.05	1.7
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.3	< 0.05	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.1	< 0.05	1.3
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.3	< 0.05	0.57
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	6.2	< 0.05	1.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	< 0.05	0.55
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	5.2	< 0.05	1.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.3	< 0.05	0.78
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.43	< 0.05	0.14
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.2	< 0.05	0.78

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	43.6	< 0.80	10.9

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	14	7.4	15	9.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.5	1.5	1.4	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	36	24	41	32	43
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	9.7	13	15	34
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	11	36	19	30
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	44	33	27	29	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	34	70	71	81

Lab Sample Number				805241	805242	805243	805244	805245
Sample Reference				TP113	TP113	WS101	WS102A	WS104C
Sample Number				5	1	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	0.50-0.55	0.00-0.20	0.10-0.20
Date Sampled				17/08/2017	17/08/2017	16/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	46
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	13	-	-	53
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.1	3.2	-	-	2.5
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	-	-	14
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	15	-	-	120
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	11	24	-	-	140

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Project / Site name: Otterpool

Lab Sample Number				805241	805242	805243	805244	805245
Sample Reference				TP113	TP113	WS101	WS102A	WS104C
Sample Number				5	1	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	0.50-0.55	0.00-0.20	0.10-0.20
Date Sampled				17/08/2017	17/08/2017	16/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Lab Sample Number				805241	805242	805243	805244	805245
Sample Reference				TP113	TP113	WS101	WS102A	WS104C
Sample Number				5	1	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	0.50-0.55	0.00-0.20	0.10-0.20
Date Sampled				17/08/2017	17/08/2017	16/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
VOC % Match	%	N/A	NONE	-	-	-	-	-

Lab Sample Number				805241	805242	805243	805244	805245
Sample Reference				TP113	TP113	WS101	WS102A	WS104C
Sample Number				5	1	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	0.50-0.55	0.00-0.20	0.10-0.20
Date Sampled				17/08/2017	17/08/2017	16/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

Lab Sample Number				805241	805242	805243	805244	805245
Sample Reference				TP113	TP113	WS101	WS102A	WS104C
Sample Number				5	1	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	3.00	0.50-0.55	0.00-0.20	0.10-0.20
Date Sampled				17/08/2017	17/08/2017	16/08/2017	17/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs TICs								
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-

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Project / Site name: Otterpool

Lab Sample Number				805246	805247	805248	805249	805250
Sample Reference				WS104C	WS109	WS110	WS110	WS111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80-1.90	0.10-0.20	0.05-0.15	0.50-0.55	0.48-0.60
Date Sampled				17/08/2017	16/08/2017	16/08/2017	16/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	42	< 0.1	< 0.1	< 0.1	68
Moisture Content	%	N/A	NONE	13	12	13	11	8.3
Total mass of sample received	kg	0.001	NONE	1.5	2.0	1.2	1.6	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.9	7.0	7.1	10.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	0.012	0.016	0.012	0.18
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0024	0.010	0.049	0.0097	0.022
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.11	0.14	< 0.05	0.43
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.57	0.27	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.37	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.47	< 0.05	< 0.05	0.19
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	4.2	0.97	< 0.05	0.67
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.26	< 0.05	0.13
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	12	4.4	< 0.05	1.1
Pyrene	mg/kg	0.05	MCERTS	< 0.05	10	3.4	< 0.05	0.88
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	8.4	2.3	< 0.05	0.89
Chrysene	mg/kg	0.05	MCERTS	< 0.05	3.8	1.2	< 0.05	0.46
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	9.8	3.5	< 0.05	1.0
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	3.0	1.1	< 0.05	0.50
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	8.3	2.9	< 0.05	1.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	4.2	1.5	< 0.05	0.53
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.79	0.27	< 0.05	0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	3.5	1.4	< 0.05	0.50
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	70.8	23.5	< 0.80	8.45
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	15	14	5.5	16
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.9	4.3	1.2	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.3	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	32	23	18	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.5	11	61	9.7	64
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	60	340	27	64
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	27	22	5.6	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.1	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	29	71	240	28	140

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Project / Site name: Otterpool

Lab Sample Number				805246	805247	805248	805249	805250
Sample Reference				WS104C	WS109	WS110	WS110	WS111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80-1.90	0.10-0.20	0.05-0.15	0.50-0.55	0.48-0.60
Date Sampled				17/08/2017	16/08/2017	16/08/2017	16/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	1.3	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	-	12
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	< 8.0	-	47
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	8.4	50	-	130
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	10	58	-	180
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	2.3
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	7.1	3.2	-	5.4
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	70	25	-	18
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	230	110	-	22
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	310	140	-	48

Lab Sample Number				805246	805247	805248	805249	805250
Sample Reference				WS104C	WS109	WS110	WS110	WS111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80-1.90	0.10-0.20	0.05-0.15	0.50-0.55	0.48-0.60
Date Sampled				17/08/2017	16/08/2017	16/08/2017	16/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Lab Sample Number				805246	805247	805248	805249	805250
Sample Reference				WS104C	WS109	WS110	WS110	WS111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80-1.90	0.10-0.20	0.05-0.15	0.50-0.55	0.48-0.60
Date Sampled				17/08/2017	16/08/2017	16/08/2017	16/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
VOC % Match	%	N/A	NONE	-	-	-	-	-

Analytical Report Number: 17-58392

Project / Site name: Otterpool

Lab Sample Number				805246	805247	805248	805249	805250
Sample Reference				WS104C	WS109	WS110	WS110	WS111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80-1.90	0.10-0.20	0.05-0.15	0.50-0.55	0.48-0.60
Date Sampled				17/08/2017	16/08/2017	16/08/2017	16/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Lab Sample Number				805246	805247	805248	805249	805250
Sample Reference				WS104C	WS109	WS110	WS110	WS111
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80-1.90	0.10-0.20	0.05-0.15	0.50-0.55	0.48-0.60
Date Sampled				17/08/2017	16/08/2017	16/08/2017	16/08/2017	17/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs TICs								
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-
SVOCs TICs Compound Name		N/A	NONE	-	-	-	-	-
SVOC % Match	%	N/A	NONE	-	-	-	-	-

Lab Sample Number				805251				
Sample Reference				WS112				
Sample Number				None Supplied				
Depth (m)				0.50-0.55				
Date Sampled				16/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	1.6				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013				
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0045				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	1.1				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.7				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40				

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Lab Sample Number				805251				
Sample Reference				WS112				
Sample Number				None Supplied				
Depth (m)				0.50-0.55				
Date Sampled				16/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-				
Toluene	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-xylene	µg/kg	1	MCERTS	-				
o-xylene	µg/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-				
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-				
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-				

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Lab Sample Number				805251				
Sample Reference				WS112				
Sample Number				None Supplied				
Depth (m)				0.50-0.55				
Date Sampled				16/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-				
Chloroethane	µg/kg	1	NONE	-				
Bromomethane	µg/kg	1	ISO 17025	-				
Vinyl Chloride	µg/kg	1	NONE	-				
Trichlorofluoromethane	µg/kg	1	NONE	-				
1,1-Dichloroethene	µg/kg	1	NONE	-				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-				
1,1-Dichloroethane	µg/kg	1	MCERTS	-				
2,2-Dichloropropane	µg/kg	1	MCERTS	-				
Trichloromethane	µg/kg	1	MCERTS	-				
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-				
1,2-Dichloroethane	µg/kg	1	MCERTS	-				
1,1-Dichloropropene	µg/kg	1	MCERTS	-				
Trans-1,2-dichloroethene	µg/kg	1	NONE	-				
Benzene	µg/kg	1	MCERTS	-				
Tetrachloromethane	µg/kg	1	MCERTS	-				
1,2-Dichloropropane	µg/kg	1	MCERTS	-				
Trichloroethene	µg/kg	1	MCERTS	-				
Dibromomethane	µg/kg	1	MCERTS	-				
Bromodichloromethane	µg/kg	1	MCERTS	-				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-				
Toluene	µg/kg	1	MCERTS	-				
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-				
1,3-Dichloropropane	µg/kg	1	ISO 17025	-				
Dibromochloromethane	µg/kg	1	ISO 17025	-				
Tetrachloroethene	µg/kg	1	NONE	-				
1,2-Dibromoethane	µg/kg	1	ISO 17025	-				
Chlorobenzene	µg/kg	1	MCERTS	-				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-Xylene	µg/kg	1	MCERTS	-				
Styrene	µg/kg	1	MCERTS	-				
Tribromomethane	µg/kg	1	NONE	-				
o-Xylene	µg/kg	1	MCERTS	-				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-				
Isopropylbenzene	µg/kg	1	MCERTS	-				
Bromobenzene	µg/kg	1	MCERTS	-				
n-Propylbenzene	µg/kg	1	ISO 17025	-				
2-Chlorotoluene	µg/kg	1	MCERTS	-				
4-Chlorotoluene	µg/kg	1	MCERTS	-				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-				
tert-Butylbenzene	µg/kg	1	MCERTS	-				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-				
sec-Butylbenzene	µg/kg	1	MCERTS	-				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-				
p-Isopropyltoluene	µg/kg	1	ISO 17025	-				
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-				
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-				
Butylbenzene	µg/kg	1	MCERTS	-				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-				
Hexachlorobutadiene	µg/kg	1	MCERTS	-				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-				

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Lab Sample Number				805251				
Sample Reference				WS112				
Sample Number				None Supplied				
Depth (m)				0.50-0.55				
Date Sampled				16/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs TICs								
VOCs TICs Compound Name		N/A	NONE	-				
VOC % Match	%	N/A	NONE	-				

Lab Sample Number				805251				
Sample Reference				WS112				
Sample Number				None Supplied				
Depth (m)				0.50-0.55				
Date Sampled				16/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-				
Phenol	mg/kg	0.2	ISO 17025	-				
2-Chlorophenol	mg/kg	0.1	MCERTS	-				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-				
2-Methylphenol	mg/kg	0.3	MCERTS	-				
Hexachloroethane	mg/kg	0.05	MCERTS	-				
Nitrobenzene	mg/kg	0.3	MCERTS	-				
4-Methylphenol	mg/kg	0.2	NONE	-				
Isophorone	mg/kg	0.2	MCERTS	-				
2-Nitrophenol	mg/kg	0.3	MCERTS	-				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-				
Naphthalene	mg/kg	0.05	MCERTS	-				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-				
4-Chloroaniline	mg/kg	0.1	NONE	-				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-				
2-Methylnaphthalene	mg/kg	0.1	NONE	-				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-				
Dimethylphthalate	mg/kg	0.1	MCERTS	-				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-				
Acenaphthylene	mg/kg	0.05	MCERTS	-				
Acenaphthene	mg/kg	0.05	MCERTS	-				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-				
Dibenzofuran	mg/kg	0.2	MCERTS	-				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-				
Diethyl phthalate	mg/kg	0.2	MCERTS	-				
4-Nitroaniline	mg/kg	0.2	MCERTS	-				
Fluorene	mg/kg	0.05	MCERTS	-				
Azobenzene	mg/kg	0.3	MCERTS	-				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-				
Hexachlorobenzene	mg/kg	0.3	MCERTS	-				
Phenanthrene	mg/kg	0.05	MCERTS	-				
Anthracene	mg/kg	0.05	MCERTS	-				
Carbazole	mg/kg	0.3	MCERTS	-				
Dibutyl phthalate	mg/kg	0.2	MCERTS	-				
Anthraquinone	mg/kg	0.3	MCERTS	-				
Fluoranthene	mg/kg	0.05	MCERTS	-				
Pyrene	mg/kg	0.05	MCERTS	-				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				

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Lab Sample Number				805251				
Sample Reference				WS112				
Sample Number				None Supplied				
Depth (m)				0.50-0.55				
Date Sampled				16/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs TICs								
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				
SVOCs TICs Compound Name		N/A	NONE	-				
SVOC % Match	%	N/A	NONE	-				

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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
805231	TP101	3	0.20	Brown clay and loam with vegetation.
805232	TP102	3	0.30	Light brown loam and clay with vegetation.
805233	TP104	6	0.50	Light brown loam and clay with vegetation.
805234	TP106	3	0.20	Brown loam and clay with vegetation and gravel
805235	TP108	9	1.00	Light brown sandy clay with stones.
805236	TP109	3	0.30	Brown loam and clay with vegetation.
805237	TP110	3	0.30	Brown loam and clay with vegetation.
805238	TP113	3	0.30	Grey gravelly loam with vegetation.
805239	TP113	6	0.60	Brown sandy clay.
805240	TP113	2	1.40	Brown sandy clay.
805241	TP113	5	2.00	Brown sandy clay.
805242	TP113	1	3.00	Light brown sandy clay.
805243	WS101	None Supplied	0.50-0.55	Brown loam and clay with vegetation and brick.
805244	WS102A	None Supplied	0.00-0.20	Brown loam and clay with vegetation and gravel
805245	WS104C	None Supplied	0.10-0.20	Brown loam and clay with stones and vegetation.
805246	WS104C	None Supplied	1.80-1.90	Light brown sandy clay with stones.
805247	WS109	None Supplied	0.10-0.20	Brown loam and clay with gravel and vegetation.
805248	WS110	None Supplied	0.05-0.15	Brown loam and clay with vegetation.
805249	WS110	None Supplied	0.50-0.55	Light brown loam and clay with vegetation.
805250	WS111	None Supplied	0.48-0.60	Grey gravelly clay with stones.
805251	WS112	None Supplied	0.50-0.55	Light brown sandy clay with gravel and vegetation.

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Tentatively identified compounds (SVOC) in soil	Determination of semi-volatile organic compounds total ion count in soil by extraction with dichloromethane and hexane followed by GC-MS followed by a full library scan.	In-house method based on USEPA 8270	L064-PL	D	NONE
Tentatively identified compounds (VOC) in soil	Determination of volatile organic compounds total ion count in soil by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L073-PL	W	NONE

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 17-58613

Project / Site name:	Otterpool	**Samples received on:**	23/08/2017
Your job number:	UA008926	**Samples instructed on:**	29/08/2017
Your order number:		**Analysis completed by:**	06/09/2017
Report Issue Number:	1	**Report issued on:**	06/09/2017
Samples Analysed:	7 soil samples		

Signed: [redacted]

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-58613

Project / Site name: Otterpool

Lab Sample Number				806659	806660	806661	806662	806663
Sample Reference				HD101	HD102	HD103	BH103	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	0.50	2.00	0.30
Date Sampled				21/08/2017	21/08/2017	21/08/2017	15/08/2017	24/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	10	9.9	21	13
Total mass of sample received	kg	0.001	NONE	0.37	0.38	0.35	0.42	0.40
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.6	7.5	7.7	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.044	0.023	0.025	0.026	0.016
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0056	0.0055	0.0048	0.0019	0.0024
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	8.8	8.8	10	13
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	1.1	0.6	0.2	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	21	21	34	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13	18	34	50
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	12	12	13	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.7	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	20	23	40	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	35	36	48	47

Lab Sample Number				806659	806660	806661	806662	806663
Sample Reference				HD101	HD102	HD103	BH103	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	0.50	2.00	0.30
Date Sampled				21/08/2017	21/08/2017	21/08/2017	15/08/2017	24/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-

Analytical Report Number: 17-58613

Project / Site name: Otterpool

Lab Sample Number				806664	806665			
Sample Reference				BH105	BH105			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.30	0.50			
Date Sampled				22/08/2017	22/08/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	12	11			
Total mass of sample received	kg	0.001	NONE	0.42	0.37			

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	7.3			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.024	0.022			
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0069	0.0070			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.7	9.6			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.8			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	7.9			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	12			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	13			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.8	5.2			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	17	20			

Lab Sample Number				806664	806665			
Sample Reference				BH105	BH105			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.30	0.50			
Date Sampled				22/08/2017	22/08/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

Analytical Report Number : 17-58613

Project / Site name: Otterpool

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
806659	HD101	None Supplied	0.30	Light brown clay and sand with gravel.
806660	HD102	None Supplied	0.30	Light brown clay and sand with gravel.
806661	HD103	None Supplied	0.50	Light brown clay and sand with gravel.
806662	BH103	None Supplied	2.00	Light brown clay.
806663	BH102	None Supplied	0.30	Light brown clay and sand.
806664	BH105	None Supplied	0.30	Light brown clay and sand with gravel.
806665	BH105	None Supplied	0.50	Light brown clay and sand with gravel.

Analytical Report Number : 17-58613

Project / Site name: Otterpool

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 17-59238

Project / Site name:	Otterpool	**Samples received on:**	01/09/2017
Your job number:	UA008926	**Samples instructed on:**	05/09/2017
Your order number:		**Analysis completed by:**	13/09/2017
Report Issue Number:	1	**Report issued on:**	13/09/2017
Samples Analysed:	7 water samples		

Signed: [redacted]

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-59238

Project / Site name: Otterpool

Lab Sample Number				810197	810198	810199	810200	810201
Sample Reference				BH104	WS105	WS107	BH103	WS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.3	6.8	6.3	7.6	7.2
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	48400	134000	36900	75800	58300
Sulphate as SO_4	mg/l	0.045	ISO 17025	48	130	37	76	58
Alkalinity	mgCaCO3/l	3	ISO 17025	440	400	110	210	370
Phenols by HPLC								
Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Phenols								
Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.59	3.49	1.09	1.60	0.29
Boron (dissolved)	µg/l	10	ISO 17025	35	110	58	58	54
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.04	< 0.02	0.02
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2	4.0	0.3	3.9
Copper (dissolved)	µg/l	0.5	ISO 17025	1.9	1.1	2.1	2.6	2.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	0.25	< 0.05	0.07	0.09	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	4.6	6.9	9.0	3.5	1.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	5.3	0.7	< 0.6	1.3	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.8	8.8	5.5	2.4	2.0

Analytical Report Number: 17-59238

Project / Site name: Otterpool

Lab Sample Number				810197	810198	810199	810200	810201
Sample Reference				BH104	WS105	WS107	BH103	WS106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/08/2017	31/08/2017	31/08/2017	31/08/2017	31/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10)	µg/l	10	ISO 17025	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 17-59238

Project / Site name: Otterpool

Lab Sample Number				810202	810203			
Sample Reference				WS108	BH105			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2017	31/08/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	5.2	6.0			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Sulphate as SO_4	µg/l	45	ISO 17025	39700	173000			
Sulphate as SO_4	mg/l	0.045	ISO 17025	40	170			
Alkalinity	mgCaCO3/l	3	ISO 17025	15	55			
Phenols by HPLC								
Catechol	µg/l	0.5	NONE	< 0.5	< 0.5			
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5			
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5			
Cresols	µg/l	0.5	NONE	< 0.5	< 0.5			
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5			
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5			
Phenol	µg/l	0.5	NONE	< 0.5	< 0.5			
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5			
Total Phenols								
Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	< 3.5			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16			
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.36	1.00			
Boron (dissolved)	µg/l	10	ISO 17025	78	58			
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.23	< 0.02			
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0			
Chromium (dissolved)	µg/l	0.2	ISO 17025	2.1	< 0.2			
Copper (dissolved)	µg/l	0.5	ISO 17025	6.6	1.0			
Lead (dissolved)	µg/l	0.2	ISO 17025	0.6	< 0.2			
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05			
Nickel (dissolved)	µg/l	0.5	ISO 17025	30	5.9			
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	7.0			
Zinc (dissolved)	µg/l	0.5	ISO 17025	87	8.8			

Analytical Report Number: 17-59238

Project / Site name: Otterpool

Lab Sample Number				810202	810203			
Sample Reference				WS108	BH105			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/08/2017	31/08/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10)	µg/l	10	ISO 17025	< 10.0	< 10.0			

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 17-59238

Project / Site name: Otterpool

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in Water	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Phenols, speciated, in water, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
PRO (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L0102B-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH103		W	17-59238	810200	c	pH at 20oC in water (automated)	L099-PL	c
BH104		W	17-59238	810197	c	pH at 20oC in water (automated)	L099-PL	c
BH105		W	17-59238	810203	c	pH at 20oC in water (automated)	L099-PL	c
WS105		W	17-59238	810198	c	pH at 20oC in water (automated)	L099-PL	c
WS106		W	17-59238	810201	c	pH at 20oC in water (automated)	L099-PL	c
WS107		W	17-59238	810199	c	pH at 20oC in water (automated)	L099-PL	c
WS108		W	17-59238	810202	c	pH at 20oC in water (automated)	L099-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 17-62066

Project / Site name:	Otterpool	**Samples received on:**	21/08/2017
Your job number:	UA008926	**Samples instructed on:**	29/09/2017
Your order number:		**Analysis completed by:**	02/10/2017
Report Issue Number:	1	**Report issued on:**	02/10/2017
Samples Analysed:	6 soil samples		

Signed: [redacted]

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-62066

Project / Site name: Otterpool

Lab Sample Number				826421	826422	826423	826424	826425
Sample Reference				TP107	WS103	WS105	WS106	WS107
Sample Number				3	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.50-0.55	0.10-0.23	0.10-0.20	0.10-0.15
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	11	14	11	11
Total mass of sample received	kg	0.001	NONE	1.5	1.9	1.8	2.0	1.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile- Loose Fibres	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.3	6.1	6.8	6.6	6.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.0083	0.016	0.018	0.015
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.011	0.0030	0.026	0.011	0.011

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.16	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.51	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.18	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.95	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.5	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.3	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.29	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	13.8	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	9.5	4.9	15	21
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.5	1.3	0.8	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.3	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	77	29	41	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10	3.9	21	12	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	10	40	27	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	67	17	19	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	71	110	56	58

Analytical Report Number: 17-62066

Project / Site name: Otterpool

Lab Sample Number				826426				
Sample Reference				WS108				
Sample Number				None Supplied				
Depth (m)				0.05-0.15				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	14				
Total mass of sample received	kg	0.001	NONE	1.6				

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.6				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.021				
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.022				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.32				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	0.72				
Pyrene	mg/kg	0.05	MCERTS	0.62				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.36				
Chrysene	mg/kg	0.05	MCERTS	0.31				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.33				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.31				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.32				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.21				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.20				

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.70				

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	63				

Analytical Report Number : 17-62066

Project / Site name: Otterpool

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
826421	TP107	3	0.30	Brown clay and loam with vegetation.
826422	WS103	None Supplied	0.50-0.55	Brown clay and loam with vegetation.
826423	WS105	None Supplied	0.10-0.23	Brown clay and loam with gravel and vegetation.
826424	WS106	None Supplied	0.10-0.20	Brown clay and loam with vegetation.
826425	WS107	None Supplied	0.10-0.15	Brown clay and loam with vegetation.
826426	WS108	None Supplied	0.05-0.15	Brown loam and clay with vegetation.

Analytical Report Number : 17-62066

Project / Site name: Otterpool

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample Deviation Report

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP107	3	S	17-62066	826421	a			
WS103		S	17-62066	826422	a			
WS105		S	17-62066	826423	a			
WS106		S	17-62066	826424	a			
WS107		S	17-62066	826425	a			
WS108		S	17-62066	826426	a			

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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APPENDIX B

Arcadis Ground Investigation Factual Report, November 2018

OTTERPOOL PHASE 2

Ground Investigation Report

November 2018

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Otterpool Phase 2

Ground Investigation Report

AUTHORISED SIGNATURES

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Report No	10011914-AFS-GLR-G001
Date	November 2018

Version control

Version	Date	Author	Changes
00	November 2018	P. Kadambala	

This report dated November has been prepared for Folkestone & Hythe District Council (the "Client") in accordance with the terms and conditions of appointment dated 21st May 2018 (the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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1 INTRODUCTION

Folkestone & Hythe District Council propose to develop a new garden town known as Otterpool Park in the county of Kent, to the south east of Ashford.. This ground investigation was commissioned by Folkestone & Hythe District Council, 'the Client', to inform on the ground conditions at the site.

An initial phase of ground investigation was completed by Arcadis Consulting (UK) Ltd in August 2017 [2]. The second phase of ground investigation, reported herein, was instructed on 21st May 2018.

This report provides a factual account of the fieldwork undertaken during the second phase of the investigation to obtain addition information including engineering descriptions of the various strata encountered, results of *in situ* testing including groundwater and land gas monitoring and the subsequent geotechnical and geo-environmental laboratory testing undertaken on samples obtained.

1.1 Limitations

This report has been prepared for the Client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document, including the electronic format and any AGS data, shall remain the property of Arcadis.

Arcadis do not accept liability for any use of the information presented in this report unless it is signed by the author, checker and approver and marked as final.

It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, seasonal, climatic variations and those recorded in this report are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

1.2 Proposed Development

The proposed development comprises a new garden town which will include housing, land for employment, shops, schools and medical centres, as well as extensive open spaces and access to the countryside.

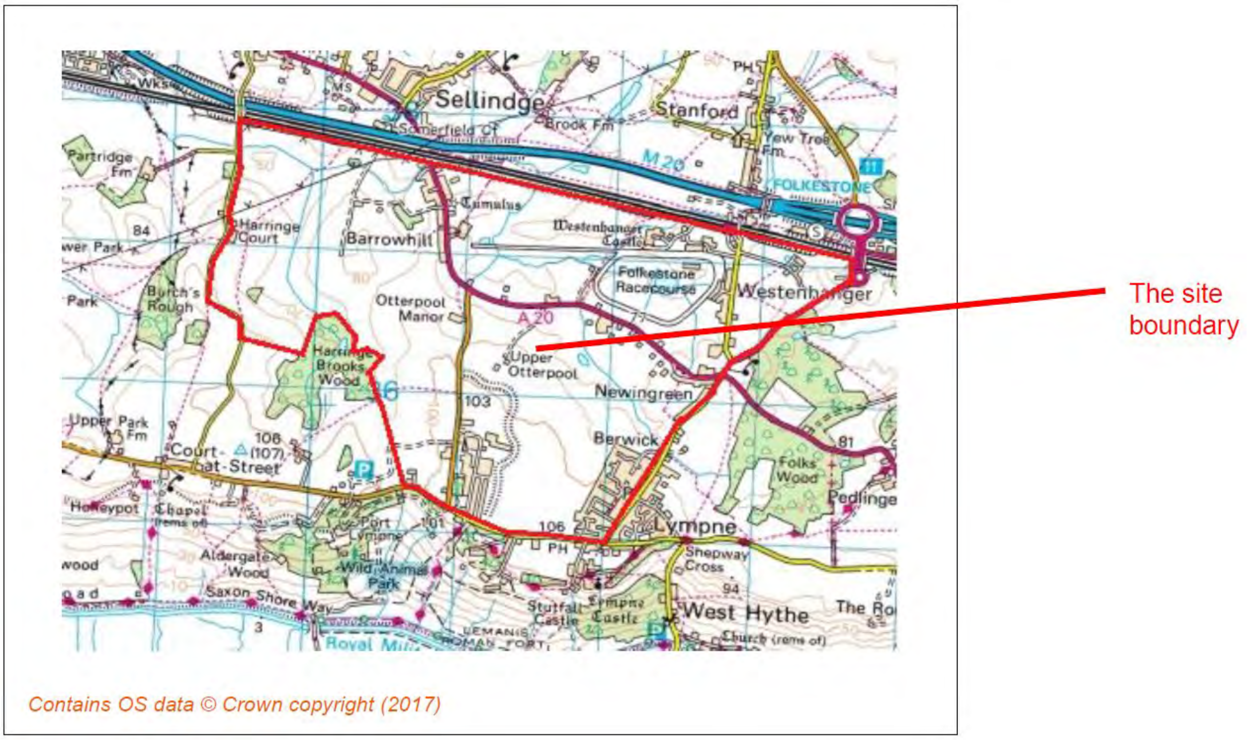
1.3 Existing Information

a. Link Park Hydrogeological Assessment Report [1], Peter Brett Associates 2008.
b. Otterpool Park Ground Investigation Factual Report [2], Arcadis 2017.

2 SITE DETAILS

2.1 Site Location and Description

The site is situated approximately 6 km southeast of Ashford and 12 km west of Folkestone centred at an approximate National Grid Reference (NGR) TR126371. Figure 2-1 shows the site location.



The site boundary

Contains OS data © Crown copyright (2017)

Figure 2-1 Site Location

At the time of the investigation, the site comprised arable and pasture fields, roads and trackways, farms and small clusters of buildings. The old Folkestone Racecourse forms the northeast part of the site. An industrial estate is located in the southern part of the site, and is surrounded by an earth embankment.

The A20 traverses the site in a roughly east to west orientation, and the B2067 traverses the site north to south. There are sporadic ditches and ponds across the site and a dirt-bike track located to the north west of the site. The M20 and a railway line borders the site to the north, and the site is surrounded by agricultural land in all other directions. Small towns such as Westenhanger, Newingreen and Lympne are located to the east of the site.

Springfiled Wood and Park Wood are located within the site boundary. Rabbit Wood, Harringe Brook Woods and Folks Wood border the site to the west, southwest and east respectively.

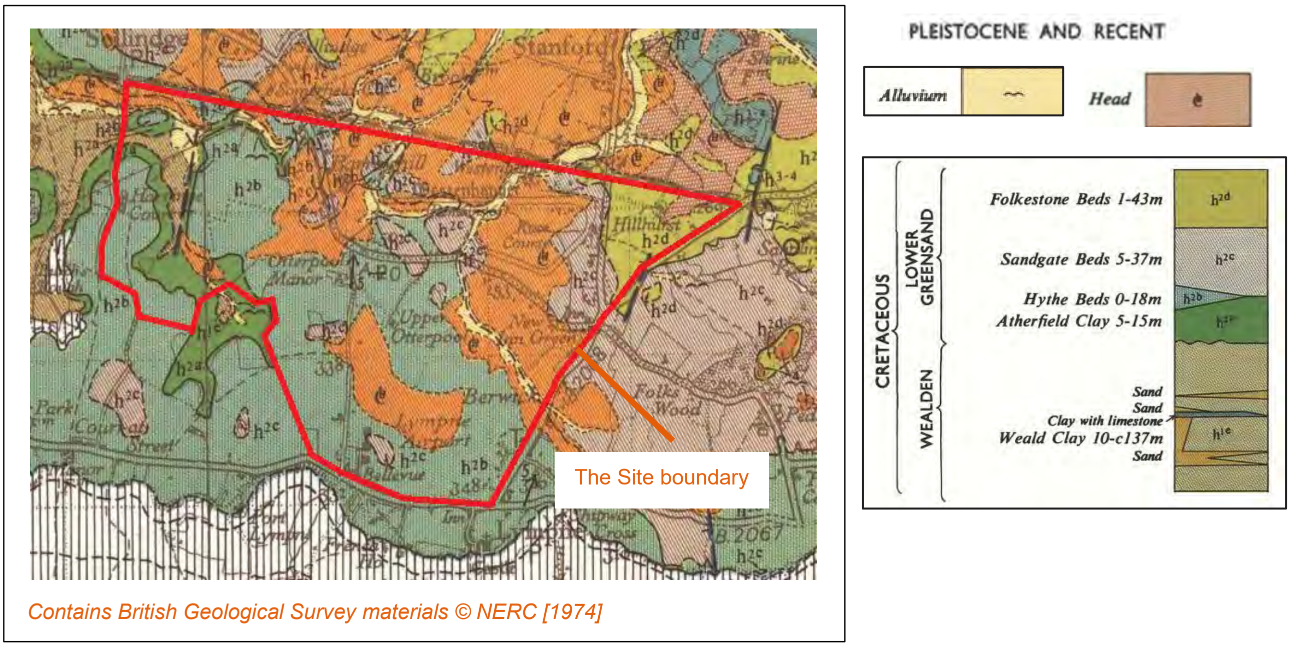
The topography of the site slopes downwards towards the north, with an approximate ground elevation of 100 m AOD on the sites southern boundary (B2067) to 65 m AOD on the sites northern boundary (railway line). Barrowhill, which is located in the northwest part of the site, has a ground elevation of 80 m AOD.

2.2 Geology

The published 1:50 000 scale British Geological Survey (BGS) map of the area incorporating the site, Sheet 305 & 306 [3], and the BGS online GeoIndex [9] indicate that approximately 50% of the site is covered by Head (clay and silt) superficial deposits. The geological map indicates these deposits may be more gravel and sand dominated in the north and east of the site. Alluvium is shown associated with tributaries of the East Stour River, which drain most of the site towards the northeast.

The bedrock beneath encompasses the Lower Greensand Group, comprising the Folkestone Formation (sandstone) in the northeast corner of the site, the Sandgate Formation (sandstone, siltstone and mudstone) in the north and east and in three small outliers, and the Hythe Formation (sandstone and limestone) in the south and west. Underlying the Hythe Formation are mudstones of the Atherfield Clay and Weald Clay Formations, which outcrop on the slopes to the south of the site.

The general distribution of the strata at the site is shown in Figure 2-2. A summary of the anticipated geological sequence is shown in Table 2-2.



The Site boundary

Contains British Geological Survey materials © NERC [1974]

Figure 2-2 Geological Setting

Two faults are located on site comprising a north to south trending fault located approximately 800 m east of the site's western boundary. The fault sub-crop is approximately 1 km long and the downthrow is to east. A second north to south trending fault is located on the eastern boundary of the site. The fault sub-crop is approximately 700 m long, and the downthrow is to the west.

The Coal Authority website [12] indicates no evidence of coal outcrops or mining activities within the immediate vicinity of the site. Environment Agency [10] records show an historic landfill located to the north of Lympne Industrial Estate, although no exploratory hole locations are located in this area.

In addition to the published data described above, a review of data from BGS online GeoIndex [9] identified four historical boreholes located on site.

Period	Formation	Description
Quaternary	Alluvium	Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.
	Head	Polymict deposit: comprises gravel, sand and clay depending on upslope source and distance from source. Poorly sorted and poorly stratified deposits formed mostly by solifluction and/or hillwash and soil creep. Essentially comprises sand and gravel, locally with lenses of silt, clay or peat and organic material.
Cretaceous	Folkstone Formation	In Sussex, Kent and Surrey the formation comprises medium- and coarse-grained, well-sorted cross-bedded sands and weakly cemented sandstones; elsewhere includes calcareous sandstones. There are no formal divisions in the Weald, but equivalent beds in the west are termed the Child Okeford Sand Member and the Bedchester Sands Member.
	Sandgate Formation	Fine sands, silts and silty clays, commonly glauconitic; some sands limonitic or calcareous; some soft sandstones.
	Hythe Formation	In the western Weald, the formation comprises mainly fine- to medium-grained, sparsely glauconitic sands, sandstones and silts, locally pebbly, with calcareous or siliceous cement in beds or lenses in some areas. Some clay interbeds, including Fuller's Earth. In Kent and eastern Sussex the formation comprises, alternating sandy limestones ("Ragstone") and glauconitic sandy mudstones (Hassock).
	Atherfield Clay Formation	Generally massive yellowish brown to pale grey sandy mudstone throughout most of its outcrop, with an impersistent phosphatic pebble bed with vertebrate bones, gritty sandstone or very shelly sandy mudstone with glauconite, at the base. At the type site on the Isle of Wight, the predominant lithology is blue grey mudstone, variably sandy with calcareous concretions; the formation includes beds of sandstone, clay ironstone and phosphatic nodules. Weathers to a chocolate brown, bluish grey and brown, mottled pinkish brown to orange.
	Weald Clay Formation	Dark grey thinly-bedded mudstones (shales) and mudstones with subordinate siltstones, fine- to medium-grained sandstones, including calcareous sandstone (e.g. Horsham Stone Member), shelly limestones (the so called "Paludina Limestones") and clay ironstones.

Table 2-1 Anticipated geological sequence

2.3 Hydrogeology and Hydrology

The superficial deposits (Alluvium) are classified as a Secondary A aquifer, meaning "*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*".

The superficial deposits (Head) located in the northeast part of the site are classified as a Secondary Undifferentiated aquifer, meaning "this *has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type*".

The bedrock deposits (Folkstone Formation and Hythe Formation) are classified as Principal aquifers, meaning "*these are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale*".

The bedrock deposits (Sandgate Formation) are classified as a Secondary A aquifer.

The bedrock deposits (Atherfield Clay Formation and Weald Clay Formation) are classified as Unproductive Strata, meaning "*these are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow*".

The site is not situated in a source protection zone.The closest surface water feature is the East Stour River, which is located in the northern part of the site and is trending from east to west. A number of small streams and ponds feed into the East Stour River from across the site. A spring is located in the southeast part of the site. A flood risk zone, level 2 and 3, is located in the northern part of the site. This is associated with East Stour River [11].

3 FIELDWORK

3.1 General

Ground investigation works, reported herein, were carried out in a single phase between August 15th 2018 and September 06th 2018. The scope of the ground investigation is summarised in Table 3-1. The ground investigation methods were undertaken in general accordance with the principles set out in BS EN 1997-2:2007 [5] and with the general practice described in BS5930:2015 [6]. The investigation works were carried out under the supervision of a suitably experienced ground engineer who undertook the logging and reporting of the exploratory holes and in situ testing.

Location ID	Hole Type	Scheduled Depth (m)	Main Objectives
BH201	RC	10 m or 1 m into natural ground	Investigate former inert landfill (depth of fill, contam, stability).
BH202	RC		
BH203	RC		Investigate former spoil heap (depth of MG, contam, stability).
BH204	RC	10.0	Investigate infiltration potential and current groundwater level. Infiltration test at 5m depth unless in groundwater.
BH205	**No access granted**		
BH206	RC	10.0	Investigate infiltration potential and current groundwater level. Infiltration test at 5m depth unless in groundwater.
BH207	RC	10.0	
BH208	DS	10.0	Investigate infiltration potential and current groundwater level.
BH209	DS	10.0	
BH210	**Omitted from original scope by designer**		
WS201	DS	5.0	Detect gas/gw contamination from industrial estate
WS202	DS	5.0	
WS203	DS	5.0	
TP201	TP	4 m or 0.5 m into top of natural ground	Investiate anomaly Z62
TP202	TP		Investigate former inert landfill (depth of fill, contam, stability) Anomaly Z29
TP203	TP	Approx. 1m to 2m below bund surface.	Investigate bund material
TP204	TP		
TP205	TP		
TP206	TP	5 m or 0.5 m into top of natural ground	Investigate former spoil heap (depth of MG, contam, stability)
TP207	**Changed to HD201**		

Location ID	Hole Type	Scheduled Depth (m)	Main Objectives
TP208	TP	2.5	Infiltration potential. BRE soakaway test.
TP209	TP		
TP210	TP		
TP211	TP		
TP212	**No access granted**		
TP213	TP	2.5	Infiltration potential. BRE soakaway test.
TP214	TP		
TP215	TP		
TP216	**TBC**		
TP217	TP	2.5	Infiltration potential. BRE soakaway test.
TP218	TP		
TP219	TP		
TP220	TP		
TP221	TP		
TP222	TP		
TP223	TP		
TP224	**Omitted from original scope by designer**		
TP225	**Omitted from original scope by designer**		
TP226	TP	2.5	Infiltration potential. BRE soakaway test
TP227	TP	Approx. 1 to 2m below bund surface.	Investigate bund material
TP228	TP	4m or natural ground	Investigate possible Made Ground (Zetica Z26 dense ferrous objects)
HD201	HD	1.0	Contam samples from former rifle range

Table 3-1 Initial ground investigation scope

Notes

TP = trial pitting, HD = hand dug trial pitting, WLS = windowless sampling, RC = rotary core drilling.

3.2 Exploratory Holes

3.2.1 Exploratory Hole Locations

The co-ordinates and elevations of the exploratory hole locations were obtained by the Arcadis supervising engineer using a Trimble VRS NOW GPRS system; allowing an accuracy of +/-50 mm.

Drawing 10011914-01-GLR-EHP-0001 presented in Appendix A displays the as-constructed exploratory hole locations while the co-ordinates and elevation of the ground surface at each exploratory hole location are given on the individual logs.

3.2.2 Investigation Methodology

The following methods and techniques were undertaken to construct the exploratory holes at the site. The completed scope of investigation is summarised in Table 3-2 below.

Details of the methods of investigation and associated standards adopted are presented in Appendix B; the exploratory hole records are presented in Appendix C, a key to the notation and symbols used on the logs is presented in Appendix B.

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
BH201	RC	31-Aug-2018	31-Aug-2018	5.00	Target depth into natural ground.
BH202	RC	29-Aug-2018	30-Aug-2018	10.50	Target depth.
BH203	RC	28-Aug-2018	29-Aug-2018	10.50	Target depth.
BH204	RC	3-Sep-2018	4-Sep-2018	10.00	Target depth.
BH205	**Omitted from scope**				
BH206	RC	5-Sep-2018	6-Sep-2018	6.70	Designer’s Instruction
BH207	RC	6-Sep-2018	6-Sep-2018	5.00	Designer’s Instruction
BH208	RC	15-Aug-2018	17-Aug-2018	6.00	Health and Safety concerns..
BH209	RC	24-Aug-2018	27-Aug-2018	10.50	Target depth.
BH210	**Omitted from scope**				
HD201	IP	29-Aug-2018	29-Aug-2018	1.00	Target depth.
TP201	TP	23-Aug-2018	23-Aug-2018	3.40	Hard strata.
TP202	TP	23-Aug-2018	23-Aug-2018	2.60	Hard strata

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
TP203	TP	31-Aug-2018	31-Aug-2018	1.30	Hard strata
TP204	TP	30-Aug-2018	30-Aug-2018	1.90	Target depth.
TP205	TP	30-Aug-2018	30-Aug-2018	1.20	Ground instability
TP206	TP	31-Aug-2018	31-Aug-2018	0.70	Hard strata
TP208	TP	24-Aug-2018	24-Aug-2018	2.60	Hard strata
TP209	TP	24-Aug-2018	24-Aug-2018	2.35	Hard strata
TP210	TP	28-Aug-2018	28-Aug-2018	2.50	Target depth.
TP211	TP	28-Aug-2018	28-Aug-2018	2.05	Hard strata.
TP212	**Omitted from scope**				
TP213	TP	21-Aug-2018	21-Aug-2018	2.50	Target depth.
TP214	TP	20-Aug-2018	20-Aug-2018	2.40	Target depth.
TP215	TP	20-Aug-2018	20-Aug-2018	2.50	Target depth.
TP216	**Omitted from scope**				
TP217	TP	15-Aug-2018	15-Aug-2018	2.60	Target depth.
TP218	TP	16-Aug-2018	16-Aug-2018	2.70	Target depth.
TP219	TP	16-Aug-2018	16-Aug-2018	0.65	Metal pipe found at 0.65mbgl. Pit relocated to TP219A
TP219A	TP	16-Aug-2018	16-Aug-2018	1.60	Hard strata.
TP220	TP	17-Aug-2018	17-Aug-2018	2.50	Target depth.
TP221	TP	21-Aug-2018	21-Aug-2018	1.50	Hard strata.

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
TP222	TP	22-Aug-2018	22-Aug-2018	1.65	Hard strata.
TP223	TP	29-Aug-2018	29-Aug-2018	2.60	Target depth.
TP224	**Omitted from scope**				
TP225	**Omitted from scope**				
TP226	TP	29-Aug-2018	29-Aug-2018	0.40	Hard strata.
TP227	TP	31-Aug-2018	31-Aug-2018	2.30	Target depth.
TP228	TP	29-Aug-2018	29-Aug-2018	1.70	Hard strata
WS201	WLS	30-Aug-2018	30-Aug-2018	3.50	Hard strata.
WS202	WLS	30-Aug-2018	30-Aug-2018	5.00	Target depth.
WS203	WLS	30-Aug-2018	30-Aug-2018	3.00	Hard strata

Table 3 2. Summary of completed exploratory holes

Notes
TP = trial pitting, HD = hand dug trial pitting, WLS = windowless sampling, RC = rotary core drilling.

3.2.3 Dynamic Sampling

Dynamic sampling was completed using a track-mounted sampling rig capable of driving windowless sampling tubes using a mechanical hammer dropped repeatedly from a self-governed height/hydraulic hammer drive head to advance window sample tubes into the ground.

The number of blows for the mechanical hammer was recorded together with a description of the recovered materials by the lead driller.

Photographs of the materials recovered are presented with the appropriate hole log. To enable a representative photographic record, the samples were split prior to the photograph and subsequently destructively logged.

Due to the method of investigation, the materials recovered within the sampler apparatus were generally disturbed and were assessed as complying with Class 3 to Class 5 of BS EN 22475-2. Sub-samples of the material recovered in the liners were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and small bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Standard penetration tests (SPT) were undertaken using the track mounted rig at 1.0 m centres, and 1.5 m centres below 5.0m until the termination depth of the hole. Cone penetration tests (CPT) were undertaken where SPTs were deemed inappropriate.

3.2.4 Rotary Drilling

Rotary core drilling was undertaken using a track mounted multi-utility drilling rig. The drilling used standard PWF double-tube core barrels with a T6-116 type of bit and casing to produce core of 116 mm diameter. The boreholes were advanced using a compressed air mist.

Where the specified core recovery was not achieved, the length of core run was reduced on subsequent core runs until recovery improved.

Recovered cores were retained in appropriately sized semi-rigid plastic liner and placed in wooden core boxes for transport and logging. Photographs of each core box showing the recovered cores are presented with the appropriate rotary borehole log.

Sub-samples of core were removed from the core runs at intervals specified for subsequent laboratory testing, the location of the sub samples was indicated by placing wood sections to represent the core removed.

ROTARY DRILL SIZES

Size	Hole	Core
	mm	mm
T6 Series		
T6-H	99	79
T6-101	101.5	79
T6-116	116	93
T6-131	131	108
T6-146	146	123
WF Series		
HWF	99.2	76.2
PWF	120.6	92.1
SWF	146	112.8
UWF	173	139.8
412		
412F	107	74.7

3.2.5 Trial Pitting/Trial Trenches

Trial pits were undertaken using a mechanical back hoe excavator. Hand dug trial pits (HD) were conducted using hand digging tools. For the machine excavated pits, a JCB 3CX excavator was used and pits were entirely logged from the surface and arisings.

Samples of the material recovered in the trial pits were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was assessed as significant.

Photographic records of the trial pit elevation and arisings were taken and are presented with the associated trial pit log.

3.3 *In situ* Testing

3.3.1 Penetration Testing

3.3.1.1 Standard Penetration Tests

Standard penetration tests (SPT) were carried out as required in the investigation scope and in accordance with the methods given in the standard procedures presented within Appendix B. Generally tests were undertaken at regular intervals throughout the borehole to provide a profile of the soil's resistance with depth and a disturbed soil samples was recovered from the SPT split-spoon tool or a disturbed sample was taken over the range of the test interval.

The N-values as determined in the field are presented on the borehole logs as uncorrected values that do not take into account the energy losses or efficiency of the automatic trip hammer used to drive the test tool into the ground. The calibration certification for the test devices used in the investigation is presented in Appendix D.

3.3.2 Strength and Deformation Testing

3.3.2.1 Determination of undrained shear strength using Hand Vane apparatus

Hand shear vane tests were carried out using a Pilcon hand shear vane with a cruciform vane of 19 mm diameter. The tests were made in the sides of trial pits/base of the exploratory hole/in the end of recovered thin wall samples of suitable Quality Class as appropriate.

The test was performed in general accordance with the manufacturer's instructions and the vane was inserted a minimum distance of 70 mm below the surface tested. The vane head was rotated slowly at a speed not greater than 1 revolution per minute until the soil has failed in shear or the maximum reading of the device was achieved. For valid tests, the remoulded strength of the failed soil was determined by rapidly rotating the vane head for five complete rotations and allowing a minimum rest period of 3 minutes before reapplying torque to the vane.

The undrained soil strength was read directly from the calibrated vane head in kPa. It should be noted that these values are based on an empirical relationship derived by Pilcon from undrained triaxial compression tests on samples of London Clay.

Where possible, four tests were made to provide an average value, however, it should be noted that where natural fissures or discontinuities are present the minimum values may provide a better representation of the mass consistency of the soil and may be significant. A summary of the data collated is presented in Table 3-3.

Location ID	Test depth (m)	Test 1		Test 2		Test 3		Test 4	
		Peak	Rem	Peak	Rem	Peak	Rem	Peak	Rem
WS201	2.20	20	10	22	10	N/A	N/A	N/A	N/A
TP209	1.80	25	10	26	10	28	12	N/A	N/A
TP213	1.00	35	30	N/A	N/A	N/A	N/A	N/A	N/A
TP213	1.01	40	30	N/A	N/A	N/A	N/A	N/A	N/A
TP213	1.02	60	50	N/A	N/A	N/A	N/A	N/A	N/A
TP213	1.50	30	25	N/A	N/A	N/A	N/A	N/A	N/A
TP213	1.51	40	35	N/A	N/A	N/A	N/A	N/A	N/A
TP213	1.52	50	45	N/A	N/A	N/A	N/A	N/A	N/A
TP213	2.00	50	42	N/A	N/A	N/A	N/A	N/A	N/A
TP213	2.01	60	48	N/A	N/A	N/A	N/A	N/A	N/A
TP213	2.02	55	48	N/A	N/A	N/A	N/A	N/A	N/A
TP217	1.50	44	20	35	20	N/A	N/A	N/A	N/A
TP217	1.70	56	28	56	28	30	28	N/A	N/A
TP220	1.40	30	10	N/A	N/A	N/A	N/A	N/A	N/A

TP220	1.80	44	20	N/A	N/A	N/A	N/A	N/A	N/A
TP220	2.50	50	20	N/A	N/A	N/A	N/A	N/A	N/A

Table 3-3 Summary of hand vane shear strength field test data

Due to the nature of the samples tested, the results are indicative for assistance in determining soil consistency for logging purposes only and should not be used to classify soil strength.

3.3.3 Hydraulic Tests

3.3.3.1 Soakaway Tests

The soil infiltration rate was determined by conducting a soakaway tests in accordance with the methodology described in BRE 365 [4]. The tests were conducted in trial pits dug to the anticipated soakaway depth. Summary information of the tests is presented in Table 3-4 while detailed test sheets are presented with the relevant trial pit log in Appendix C.

Location ID	Depth of pit (m)	Soil Infiltration Rate *f* ms^{-1}	Comments
TP210	2.50	Not permeable	
TP211	2.05	Not permeable	Minor collapse.
TP213	2.50	No valid data	Test erminated after 85min due to lack of soakage.
TP214	2.40	Not permeable	Test terminated due to soil collapse after 33 min
TP215	2.50	Not permeable	
TP217	2.60	No valid data	Test terminated after 75 min due to lack of soakage.
TP218	2.70	No valid data	Test terminated after 60 min due to lack of soakage.
TP219A	0.65	2.09E-06	
TP220	2.50	No valid data	Test terminated after 20 min due to lack of soakage.
TP221	1.50	5.42E-09	
TP222	1.65	6.85E-09	
TP223	2.60	Not permeable	Test terminated after 60 min due to lack of soakage.

Table 3 4 Summary of trial pit soakage tests

3.3.4 VOC Head Space Screening

The presence of Volatile Organic Compounds (VOC) within the ground and groundwater was determined using a photoionization detector (PID) to detect the ‘headspace’ vapours emitted by the compounds. The method is applicable to a wide range of compounds that have sufficiently high volatility to be effected liberated from the soil or water matrix in normal temperature and pressure ranges.

The headspace test was undertaken on the freshly extracted soil core sample at regular intervals of 1 m by placing a small amount of material into a screw-top glass jar so that the jar was not more than half-full. The jar opening was covered with an aluminium foil sheet and the lid screwed on to form an air-tight seal. The sample and jar were then shaken for about 15 seconds to break-up and disperse the soil before resting the sample for about 5 minutes.

To assess the headspace vapour, the jar lid was removed and the PID inlet tube was inserted through the foil into the headspace area. The PID reading recorded was the highest response observed in the first 10 seconds. The screening results are presented on the relevant exploratory holes logs within Appendix C.

The testing was undertaken using a make and model PID with a 10.6 eV lamp.

3.4 Installations and Post-fieldwork Monitoring

3.4.1 Installations

Installations to enable long term land gas and groundwater monitoring monitoring of the site were made in those boreholes selected by Arcadis Consulting (UK) Ltd and the details are summarised in Table 3-5 and are also provided on the relevant borehole logs.

Location ID	Installation Type	Response Zone Top m bgl	Response Zone Base m bgl	Comments / limitations
BH201	SP50	1.00	5.00	Plain: GL-1.00m, Slotted: 1.00m – 5.00m
BH202	SP50	1.00	10.00	Plain: GL-1.00m, Slotted: 1.00m – 10.00m
BH203	SP50	2.00	3.00	Plain: GL-2.00m, Slotted: 2.00m – 3.00m
BH204	SP50	3.00	10.00	Plain: GL-3.00m, Slotted: 3.00m – 10.00m
BH206	SP50	1.50	6.70	Plain: GL-1.50m, Slotted: 1.50m – 6.70m
BH207	SP50	1.00	5.00	Plain: GL-1.00m, Slotted: 1.00m – 5.00m
BH208	SP50	2.00	6.00	Plain: GL-2.00m, Slotted: 2.00m – 6.00m
BH209	SP50	1.00	10.00	Plain: GL-1.00m, Slotted: 1.00m – 10.00m

Table 3 5 Summary exploratory hole installations

Notes
SP50 = 50mm standpipe piezometer

3.4.2 Post-fieldwork Monitoring

Post-field work monitoring was undertaken on separate visits on 19th September 2018, 26th September 2018 and 11th October 2018. The three visits to the site were made to record land gas emissions and groundwater levels. During the first monitoring visit (19th September 2018), after completion of the land gas emission monitoring, the well was purged by removing five well volumes of groundwater, where possible and *in situ* groundwater monitoring and sampling was undertaken. Where installations were purged dry, monitoring and sampling was conducted on groundwater recovered following recharging of groundwater in installations. Parameters measured during *in situ* monitoring were pH, dissolved oxygen, conductivity and redox potential.

Four installations from the first phase could not be monitored due to accessibility (gas tap misplaced or flush cover not possible to be opened). The results of the groundwater and land gas monitoring are presented within Appendix E.

4 LABORATORY TESTING

4.1 General

Geotechnical and geo-environmental chemical testing was undertaken on selected samples obtained from the exploratory holes. The testing was scheduled by the geotechnical and/or geo-environmental engineer and the testing was undertaken by an Arcadis approved testing laboratory.

4.2 Geotechnical Laboratory Testing

The geotechnical tests detailed in Table 4-1 were carried out in accordance with either BS1377:1990: Parts 1 to 8 [7]; BS EN ISO 17892: Parts 1 to 12 [8]; or other methods as listed in Table 4-1. The complete results of the geotechnical laboratory testing are presented in Appendix F

Test	Method	No of Determinations
Moisture content	BS1377 Pt2-3.2	14
4-point liquid and plastic limit	BS 1377 Pt2-4.3 & 5.3	10
Particle Size Distribution - Wet sieving	BS1377 Pt2-9.2	10
Unconsolidated Undrained Triaxial	BS1377 Pt7-8/9	1
Point Load Strength	ISRM : 2007	3
California Bearing Ratio	BS1377 Pt4-7	2
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould)	BS1377 Pt4-3.3	2
pH, water soluble nitrate, water soluble chloride, water soluble sulphate, total sulphate, total sulphur, ammonium, magnesium	BRE SD1 preferred methods	5

Table 4-1 Summary of geotechnical test data

4.3 Geo-Environmental Laboratory Testing

Geo-environmental tests were undertaken on soil, groundwater and prepared leachate specimens obtained from the samples collected from the site. Testing was carried out for the contaminants detailed in Table 4-2, Table 4-3 and Table 4-4. The results of the chemical laboratory testing are presented in Appendix G. Details of the test methodology is presented with the test results.

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn), pH	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES);	47
Hexavalent Chromium, Free Cyanide & Total Cyanide	Calorimetry	47
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	Gas Chromatography –Mass Spectrometry (GC-MS)	47

Total Petroleum Hydrocarbon Criteria Working Croup (TPH CWG)	Gas Chromatography – Mass Spectrometry (GC-MS) / Flame Ionisation Detector (GC-FID)	47
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX) and MTBE	GC-MS	41
Total Organic Carbon	BS1377 Pt 3 - Chemical and Electrochemical Tests	43
Monohydric Phenols	Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	47
Asbestos Identification	HSG 248	47

Table 4-2 Summary of geo-environmental test data – soil matrix

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn), pH, Speciated PAH, Cyanide Free & Total	ICP-OES	7
PAHs	GC-MS	7
TPH CWG	GC-FID	7
VOCs & SVOCs	GC-MS	7

Table 4-3 Summary of geo-environmental test data – groundwater matrix

Test type	Method	No of Determinations
Alkalinity	In house method based on MEWAM & USEPA Method 310.2.	3
Hexavalent Chromium, Free Cyanide & Total Cyanide	Calorimetry	3
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	Gas Chromatography –Mass Spectrometry (GC-MS)	3
Total Phenols	Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	2
Total Petroleum Hydrocarbon Criteria Working Croup (TPH CWG)	Gas Chromatography – Mass Spectrometry (GC-MS)	3
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX) and MTBE	GC-MS	3

Table 4-4 Summary of geo-environmental testing data - leachate

5 REFERENCES

General References

1. Peterbrett Associates.2008. Report on Hydrogeological Assessment. Peterbrett Associates Report 6952 JC ab. Oct 2008.
2. Arcadis Consulting. 2017. Ground Investigation Factual Report. Arcadis Consulting Report UA008926-43--AFS-GLR-G001. Dec 2017.
3. British Geological Survey. 1990. Folkstone & Dover. England and Wales Sheet 305 & 306. Bedrock and Drift Deposits. 1:50 000. BGS Keyworth, Nottingham.
4. Building Research Establishment. 2016. Soakaway Design. BRE Digest DG365. BRE, Watford.

National Standards

5. BS EN 1997-2. 2007. *Incorporating corrigendum June 2010.* Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution.
6. BS 5930. 2015. Code of practice for ground investigations. British Standards Institution.
7. BS 1377. 1990 & 2016 as amended. Method of test for soils for civil engineering purposes. Published in 9 Parts. British Standards Institution.
8. BS EN ISO 17892-1: Geotechnical investigation and testing – Laboratory testing of soil – Determination of water content. British Standards Institution.

Internet References

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10. Natural England Magic Map http://www.magic.gov.uk/MagicMap.aspx Accessed June 2018
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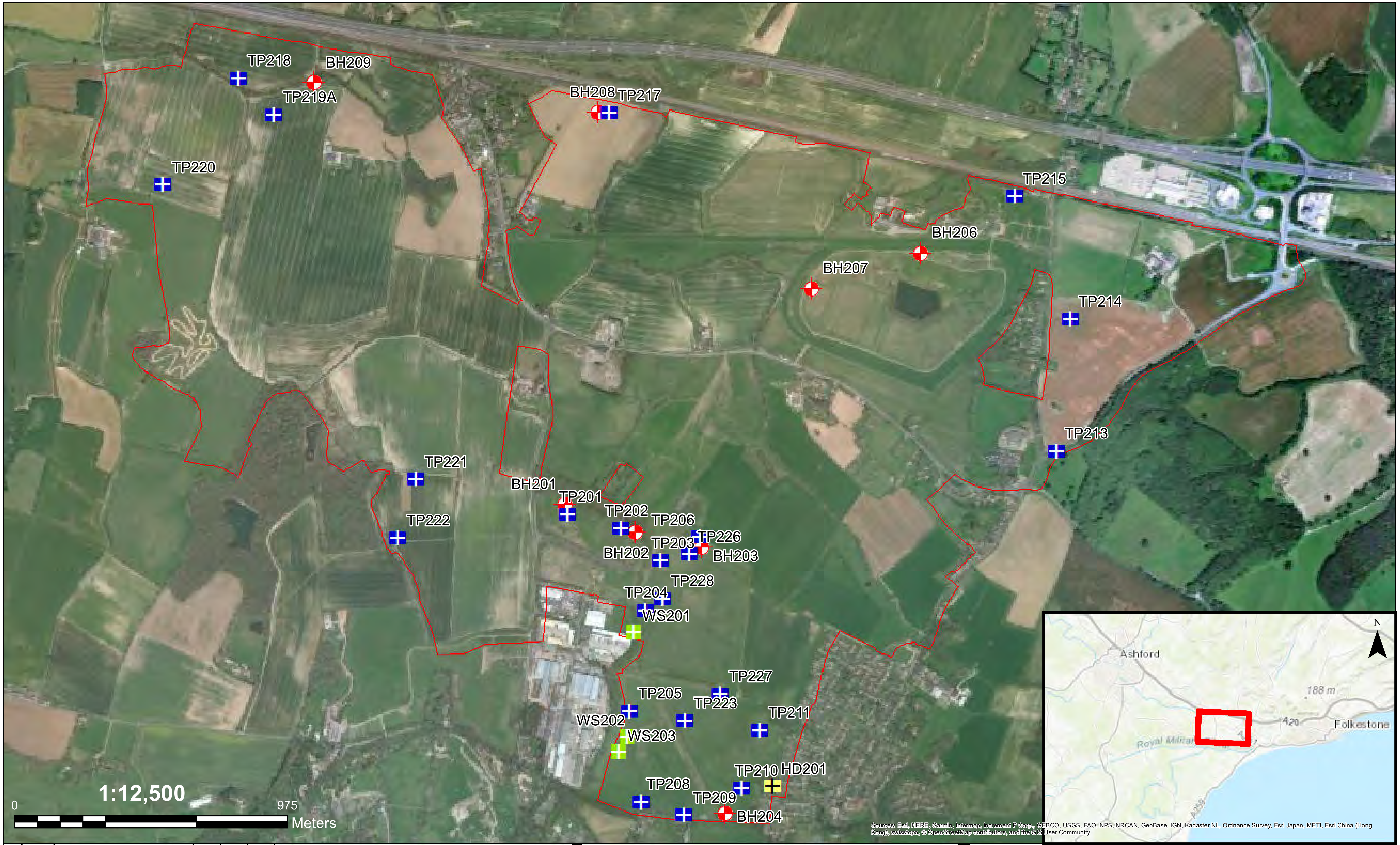
12. Coal Authority. http://mapapps2.bgs.ac.uk/coalauthority/home.html Accessed July 2018

APPENDIX A

DRAWINGS

Drawing 10011914-01-GL R-EHP-0001: Exploratory Hole Location Plan



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

REV	Date	Description	Drawn	Check	Approv
1	03/10/2018		SS	SH	JV

Legend

⌖	Borehole Logs
✚	Hand dug Trial Pit
⊞	Trial Pit
▦	Window Sample
▭	Site Boundary

Client

Folkestone & Hythe District Council

Civic Centre,
Castle Hill Avenue,
Folkestone, Kent CT20 2QY.
Phone: +44 (0) 1303 853000

Site

Otterpool – Phase 2

Suitability Description:

For Information

Designed	I Trujols	Date 03Oct2018	Signed
Drawn	S Sohni	Date 03Oct2018	Signed
Checked	S Harlow	Date 03Oct2018	Signed
Approved	J. Venn	Date 03Oct2018	Signed
Scale:	1:12,500	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	S2	Project Number:	10011914

PROJECT:

Otterpool – Phase 2

TITLE:

Exploratory Hole Location Plan

ARCADIS Design & Consultancy for natural and built assets

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Revision: 01

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APPENDIX B

STANDARD PROCEDURES

B0 General Principles

This ground investigation was undertaken in general accordance with the principles of BS EN 1997-1 [1] and BS EN 1997-2 [2] and the advice given in BS5930:2015 [8], which, provides complimentary guidance on the application of the primary standards. Where the requirements of the ground investigation specification differ from these primary standards, the investigation methodology was adapted as required and specific notes regarding methods and techniques employed were made in the appropriate report sections.

B1 Buried Services

Service clearance was undertaken in accordance with Arcadis' *Safety, Health and Environment (SHE) Standard – Avoidance of Sub-Surface Hazards and Structures Standard.* This document details the methods and safe working practices used to undertake excavations safely. Prior to breaking ground, services plans were consulted and the area scanned using a Cable Avoidance Tool (CAT) with detected signals marked on the ground. For all investigation positions, other than for machine excavated trial pits, hand excavated inspection pits are completed to 1.20 m bgl prior to the use of drilling and boring plant.

B2 Sampling requirements

The selection of sample types and sampling techniques has been chosen to take account of the soil fabric, size and quality of sample required based on whether the soils mass properties or the intact material properties of the ground are to be determined in subsequent laboratory tests. BS EN ISO 22475-1 [4] describes three generic sample groups that are:

a. Sampling by drilling. Generally a disturbed sample recovered from the drilling tool or digging equipment, typically meeting Class 3 to Class 5 requirements, with the recovered material being stored in bulk bags or sealed jar or tub containers.
b. Sampling by sampler. Typically referred to as open tube or drive sampling in which a tube with a sharp cutting edge is driven into the ground either by static thrust or dynamically driven to give a relatively undisturbed sample of Class 1 or Class 2 but may result in a Class 3 sample.
c. Block sampling. Cylindrical large diameter samples or cuboid hand-cut samples usually relatively undisturbed Class 1 and Class 2.

The open-tube sampling equipment used on the site was of a type and design that conformed to BS EN ISO 22475-1. For the purpose of this ground investigation block sampling was not required.

Generally samples were assessed on site and any unexpected deterioration in sample quality was reported to the ground engineer by the lead drilling technician.

Sufficient and representative samples were taken to allow the geo-mechanical properties of the ground to be adequately characterised and to enable the sequence of soil strata to be described by an engineering geologist or geotechnical engineer.

Where samples have been taken for chemical tests the drilling method attempted to adopt dry drilling over the sampling range that generally was achieved by the use of drill casing to separate and isolate the upper soil layers and exclude groundwater. Cross-contamination was further reduced by regular cleaning of sampling tools. Sample integrity was maintained by sealing samples immediately on collection and storing the samples in a temperature controlled cool box. Samples were despatched from the site at the end of the shift on which they were collected or as required in the project specification. Details of best practice storage, preservation and decontamination measures undertaken are given below:

Task	Soil	Groundwater	Ground Gas
Storage	Glass jars and vials supplied by the laboratory were used for the collection of soil samples to be analysed for volatile compounds. Plastic one-litre tubs were used to collect soil samples for metals analysis.	Glass vials supplied by the laboratory were used for the collection of samples to be analysed for volatile compounds. Samples to be analysed for lower volatility compounds were stored in laboratory prepared glass bottles.	1.4L Canisters supplied by the laboratory.
Preservation	Filling of sample containers as far as practicable to minimise headspace and low storage temperature to minimise the potential for volatilisation and biodegradation of petroleum hydrocarbon compounds prior to analysis.		Not required.
Decontamination	Disposable gloves were worn and changed between sample collection to prevent cross-contamination.	Groundwater samples were collected using dedicated disposable tubing / bailers, that were changed between monitoring well locations in order to prevent cross-contamination.	Disposable gloves were worn and changed between sample collection to prevent cross contamination.
Transport	Samples stored in dedicated sample boxes provided by the laboratory. Sample details and analytical requests were recorded on the laboratory chain of custody form included with samples, prior to dispatching to laboratory for analysis. Samples were dispatched to the laboratory on the day of sampling.		

B3 Sample description

Sample description was undertaken by the Arcadis site geologist in accordance with BS 5930: 2015. The descriptions of the individual samples were used to identify the sequence of strata at the exploratory hole location and from which representative exploratory hole logs were drawn.

B4 *In situ* testing

In situ geotechnical tests were undertaken taking account of the investigation scope and requirement to attain the appropriate parameters required in the geotechnical design. The tests were undertaken in accordance with the requirements of the relevant parts of BS EN ISO 22476 [5, 6, 7] and other methods as follows:

Dynamic probing

Dynamic probes were undertaken in general accordance with BS EN ISO 22476-2, BS EN 1997-2 and the national annex to BS EN 1997. The tests were generally made using the super-heavy DPSH-B configuration of the apparatus, however, it should be noted that the basis for selection of the type of dynamic probe should be a consideration of the driving energy in relation to the type of ground conditions anticipated at the site.

Where adequate correlation with borehole data is available an interpretation of the estimated soil type may be made, however, it should be noted that probing can give unreliable results in mixed soils.

Standard penetration testing

Standard penetration tests were carried out in accordance with BS EN ISO 22476-3, BS EN 1997-2 and the national Annex to BS EN 1997-2. The test records are presented on the borehole logs as blow counts for each increment with the N-value as the total number of blows of the four main test increments.

Where the N-value exceeds a total of 50 blows, the test reports the penetration in millimetres for the last test increment recorded, and the N value is indicated as greater than 50,

e.g. 4,5/12,14,18, 6 for 10 mm

indicates that the seating blows (4 and 5) were completed and that the test terminated in the 4th increment after penetrating 10 mm.

Where the seating blows exceeded 25 blows for less than 150 mm; the test was stopped and the rods remarked after which, the main drive was continued. The test is then reported as the number of blows in each seating drive for the recorded penetration with the results of the main drive given as above,

e.g. 14/11 for 45 mm/12,14,16, 8 for 10 mm.

In certain circumstances where groundwater in-flow may affect the test, particularly in fine sand or silt, low SPT blow counts may be recorded. Where the SPT blow count was very low, N values of 5 or less, the test was, at the discretion of the site engineer, continued for a further 300 mm, recording blows for each 75 mm increment. **This is not** a standard penetration test value, it does however give an indication of potential disturbance to the ground.

California Bearing Ratio

In situ California Bearing Ratio (CBR) tests were carried out in general accordance with the requirements of BS 1977-9:1990, 4.3 [10]. The CBR is a strength test that is generally concerned with pavement design and the control of pavement sub grade construction, as such it is a test that is most suited to soils with a maximum particle size not exceeding 20 mm.

TRL Dynamic cone penetrometer

The TRL DCP is a device developed by the TRL to assess the California Bearing Ratio of road sub-base by correlation. As such the device was developed for use in a limited range of soil types. The test has no formal standard the test methodology and its use is discussed in TRL report PR IN 277-04 [**Error! Reference source not found.**].

B5 Data transfer format

The data collated during the ground investigation has been organised and managed using the “AGS data format” that allows data transfer between different disciplines and organisations in accordance with BS 8574 [9].

B6 References

1. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
2. BS EN 1997-2. 2007. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution, 2010 (revised text).
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B7 Exploratory Hole Key

Key to Exploratory Hole Symbols and Abbreviations

SAMPLE TYPES

B	Bulk disturbed sample
C	Core sample
CBR-D	Disturbed sample from CBR test area
CBR-U	Undisturbed sample from CBR test area
D	Small disturbed sample
ES	Environmental soil sample
EW	Environmental water sample
G	Gas sample
L	Liner sample
SPT	SPT split spoon sample
U	Undisturbed sample
UT	Undisturbed thin wall sample
W	Water sample

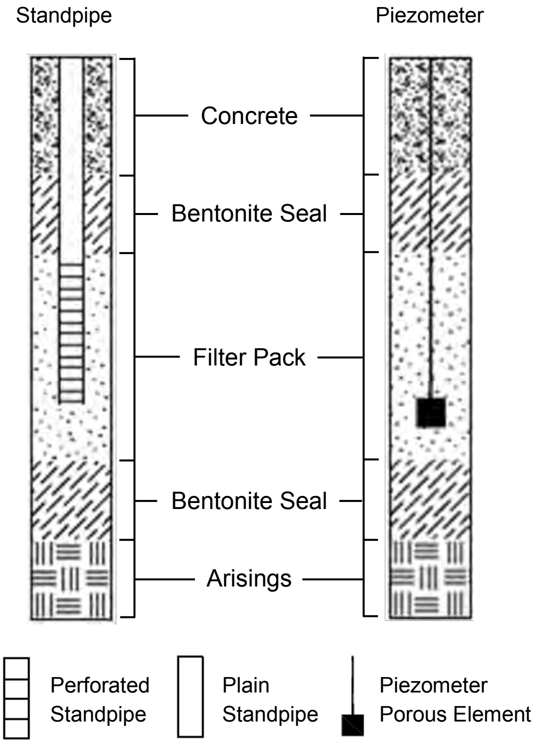
IN-SITU TESTING

SPTs	Standard Penetration Test (using a split spoon sampler)
SPTc	Standard Penetration Test (using a solid 60 degree cone)
N	Recorded SPT ‘N’ Value *
-/-	Blows/Penetration (mm) after seating blows totalling 150 mm
MX	Mexi Probe Test (records CBR as %)
HV	Hand Shear Vane Test (undrained shear strength quoted in kPa)
HP	Hand Penetrometer Test (kg/m^3)
( )	Denotes residual test value
PID	Photo Ionisation Detector (ppm) *
Kf/Kr	Permeability Test (f = falling head, r = rising head quoted in ms^{-1})
HPD	High Pressure Dilatometer Test (pressure meter)
PKR	Packer / Lugeon Permeability Test
CBR	California Bearing Ratio Test

ROTARY CORE DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation (% of intact core >100 mm)
FI	Fracture Spacing (average fracture spacing; in mm, over indicated length of core) * *
NI	Non-Intact Core
AZCL	Assumed Zone of Core Loss

INSTALLATION & BACKFILL DETAILS



GROUNDWATER

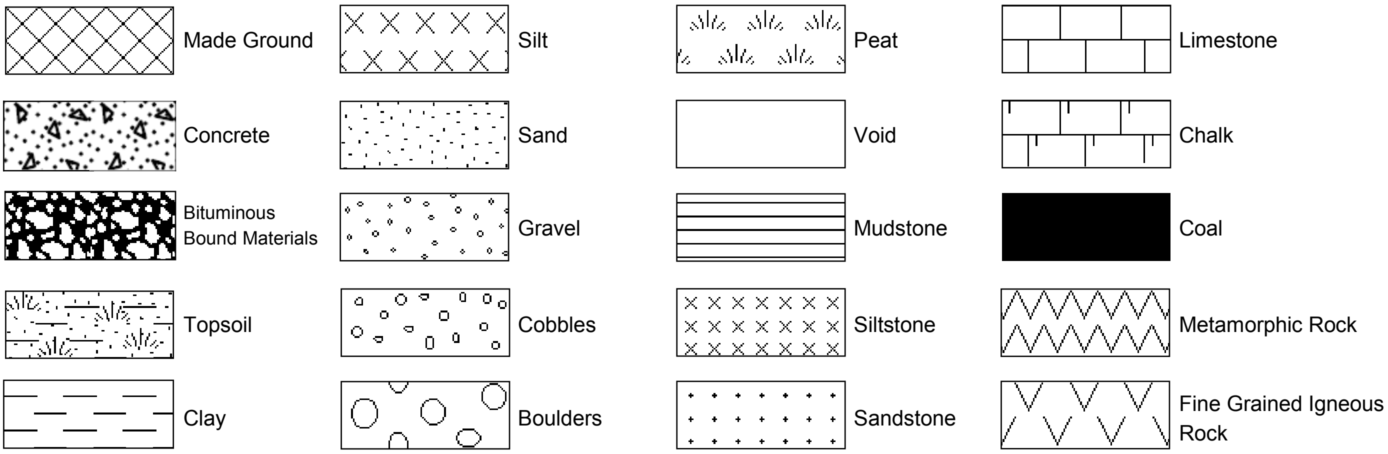
▽ Groundwater strike

▼ Standing water level after 20 minutes; 1st, 2nd etc (number denotes level order)

STRATUM BOUNDARIES

——— Unit boundary

STRATA LEGENDS - Note: Composite strata types are shown by combining symbols



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* Where a single value is quoted this is the uncorrected ‘N’ value for a full 300 mm test drive following a seating drive of 150mm. Where the full test drive penetration is not achieved the number of blows is quoted for the penetration below the test total of 300mm, e.g.: 50/75.

* * The minimum, average and maximum are shown e.g. 5/45/125.

APPENDIX C

EXPLORATORY HOLE LOGS

ARCADIS Rotary Borehole Log

BH201

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**97.22**	**31/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611070.82**	**136130.16**	**31/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA				Install/ Backfill
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend	Depth (Thickness)	Level	
0.00 - 0.30	B3	PID	<1ppm					31/08/2018 08:00		Firm to stiff brownish grey sandy CLAY. Sand is fine to coarse. [TOPSOIL]		(0.30) 0.30	96.92	
0.00 - 0.30	ES1													
0.30 - 1.20	B4									Soft to firm light brown sandy SILT. Sand is fine to coarse. [HEAD DEPOSITS]				
0.50 - 0.60	ES2	PID	<1ppm											
1.20 - 1.40	ES5	SPT(S)	N=4 (1,1/1,1,1,1)											
1.20 - 2.30	B10	PID	<1ppm	80								(2.00)		
1.90 - 2.00	ES6	PID	<1ppm											
2.30 - 2.50	B11	PID	<1ppm							Medium dense orangish brown and grey slightly gravelly clayey fine to medium SAND. Gravel is subangular to subrounded medium flint. [HEAD DEPOSITS]		2.30 (0.20)	94.92	
2.30 - 2.50	ES7													
2.50 - 2.60	ES8	SPT(S)	N=17 (3,4/3,3,5,6)									2.50	94.72	
2.50 - 3.70	B12	PID	<1ppm	100						Medium dense multicoloured orangish brown, dark brown and light grey, clayey fine SAND with frequent iron stained bands. [HEAD DEPOSITS]		(1.20)		
3.50 - 3.60	ES9	SPT(S) PID	N>50 (1 for 0mm/4 for 0mm) <1ppm			80								
3.70 - 4.00	B13			75 25	10 10 20					Weak light grey fine grained weathered SANDSTONE. Fractures are extremely closely to closely spaced, subvertical, rough and planar. [HYTHE FORMATION] Recovered as clayey sandy subangular fine to medium GRAVEL.		3.70 (1.30)	93.52	
								31/08/2018 18:00	2.00 4.00			5.00	92.22	

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	3.50	Dynamic Sample
3.50	5.00	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
3.50	4.50	80	Air mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
116	5.00	128	3.50
		128	5.00

WATER ADDED

From	To	Volume (ltr)

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
5.00m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Borehole Photography Sheet

BH201

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**97.22**	**31/08/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611070.82**	**136130.16**	**31/08/2018**

[EXPLORATORY HOLE NUMBER 201: 1.20m-4.00m]

[EXPLORATORY HOLE NUMBER 201: 1.20- 4.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**MT**	**SH**

ARCADIS Rotary Borehole Log

BH202

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **97.15**	Start Date **29/08/2018**	Scale **1:50**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611321.53**	Northing (OS mN) **136031.17**	End Date **30/08/2018**	**Sheet 1 of 2**

SAMPLES / TESTS

Depth	Type/ No.	Type/ No.	Results
0.00 - 0.20	ES1	PID	<1ppm
0.20	ES	PID	<1ppm
0.20 - 0.60	B2		
0.20 - 0.60	ES3		
0.60 - 0.80	B4	PID	<1ppm
0.60 - 0.80	ES5		
1.20 - 1.50	ES7	SPT(S)	N=4 (1,0/1,1,1,1)
1.20 - 1.80	D6		
		SPT(S)	N>50 (1,4/3,5,7,35 for 45mm)
		SPT(S)	N>50 (25 for 40mm/40,10 for 15mm)
3.40 - 3.80	C10		
3.40 - 3.80	U10		
5.70 - 5.80	C11		
7.50 - 7.77	C12		
7.50 - 7.77	U12		
8.90 - 9.10	C13		
9.10 - 9.25	D8		
9.25 - 9.50	D9		

DRILL LOG

TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%	Water Strikes
91		0	
30 30	40 40 60		
90 40			
20 0			
100 50			
0 0			
33 27			
66 20			

PROGRESS

Date Time	Casing Water
29/08/2018 08:00	
29/08/2018 18:00 30/08/2018 08:00	2.00 3.00 2.00 4.00

STRATA

Description	Depth (Thickness)	Level
Grass over dark greyish brown clayey fine to medium SAND, with abundant 1mm rootlets. [TOPSOIL]	(0.20) 0.20	96.95
MADE GROUND: Brown and black slightly gravelly clayey fine SAND. Gravel is angular to subangular fine to medium sandstone.	(0.40) 0.60	96.55
Loose very light mottled brown gravelly clayey fine to medium SAND, with low cobble content. Gravel is angular to subrounded fine to coarse sandstone. Cobbles are subangular to subrounded sandstone. [WEATHERED HYTHE FORMATION]	(1.70) 2.30	94.85
Strong light grey and brown fine grained SANDSTONE with 100mm vertical quartz veining at top. Interbedded with light grey and brown fine SAND. Fractures are closely to widely spaced, verticaL, rough, planar. [HYTHE FORMATION] No recovery. No recovery. Non intact Non intact No recovery.	(6.80) 9.10	88.05
Weathered SANDSTONE recovered as brown fine SAND. [HYTHE FORMATION]	(0.15) 9.25	87.90
Weathered SANDSTONE recovered as bluish grey fine SAND. [HYTHE FORMATION] No recovery.	(1.25)	

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	2.30	Dynamic Sample
2.30	10.50	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
2.30	10.50	0	Air mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
116	10.50	130	2.00

WATER ADDED

From	To	Volume (ltr)

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth: 10.50m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

**Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).**

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

ARCADIS Rotary Borehole Log

BH202

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**97.15**	**29/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611321.53**	**136031.17**	**30/08/2018**	**Sheet 2 of 2**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA				
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
								30/08/2018 17:00	2.00 8.00	Weathered SANDSTONE recovered as bluish grey fine SAND. [HYTHE FORMATION]		10.50	86.65	

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 1.20 2.30	1.20 2.30 10.50	Inspection Pit Dynamic Sample Rotary Core	2.30	10.50	0	Air mist							116	10.50	130	2.00			

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
10.50m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Borehole Photography Sheet

BH202

Project
Otterpool Phase 2

Client
Folkestone and Hythe District Council

Job No
10011914

Easting (OS mE)
611321.53

Ground Level (mAOD)
97.15

Northing (OS mN)
136031.17

Start Date
29/08/2018

End Date
30/08/2018

[EXPLORATORY HOLE NUMBER 202: 1.20m-8.90m]

[EXPLORATORY HOLE NUMBER 202: 1.20- 8.90m SPLIT]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
Pioneer P60D

Logged By
MT

Checked By
SH

Borehole Photography Sheet

BH202

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**97.15**	**29/08/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611321.53**	**136031.17**	**30/08/2018**

[EXPLORATORY HOLE NUMBER 202: 8.90m-10.00m]

[EXPLORATORY HOLE NUMBER 202: 8.90m-10.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**MT**	**SH**

ARCADIS Rotary Borehole Log

BH203

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**95.65**	**28/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611559.58**	**135977.57**	**29/08/2018**	**Sheet 1 of 2**

SAMPLES / TESTS

Depth	Type/ No.	Type/ No.	Results
0.20 - 0.30	ES1	PID	<1ppm
0.70	ES	PID	<1ppm
0.70 - 0.76	ES2		
0.70 - 1.10	B4		
1.00 - 1.10	ES3	PID	<1ppm
		SPT(S)	N=19 (2,2/4,4,5,6)
1.50 - 1.60	ES5	PID	11.5ppm
1.80 - 1.90	B6		
1.90 - 2.00	ES7	PID	19.2ppm
		SPT(S)	N>50 (25 for 60mm/50 for 50mm)
3.08 - 3.24	B8		
3.25 - 3.30	ES9	PID	<1ppm
		SPT(S)	N>50 (25 for 30mm/50 for 40mm)
4.20 - 4.30	ES10	PID	10.4ppm
4.85 - 5.10	B11		
5.20 - 5.45	B12		
5.50 - 5.70	ES13	PID	<1ppm
6.80 - 7.10	B14		
7.10 - 7.20	ES15	PID	<1ppm

DRILL LOG

TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%
90 90		0
60 40		
40 20		
90 70		
80 70	10 10 10	
90 75		
50 40	4	

PROGRESS

Date Time	Casing Water
29/08/2018 09:00	

STRATA

Description	Depth (Thickness)	Level
Soft brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular to subrounded fine flint. [TOPSOIL]	0.50 (0.50)	95.15
MADE GROUND: Soft to firm brown mottled orange slightly gravelly slightly sandy becoming sandy CLAY with occasional charcoal pockets (3mm). Sand is fine to coarse. Gravel is subangular to subrounded fine flint. Band of cobbles of size approximately 8 cm. Possibly reworked sandstone.	1.20 (0.70)	94.45
Soft to firm brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone. [HEAD DEPOSITS]	1.80 (0.60)	93.85
Weathered sandstone recovered as grey mottled orange brown clayey sandy subangular to subrounded fine to coarse GRAVEL of sandstone with low cobble content. Cobbles are subangular to subrounded. [HYTHE FORMATION]	2.70 (0.90)	92.95
Weathered sandstone recovered as grey brown clayey very sandy subangular to subrounded fine to coarse GRAVEL of sandstone with low cobble content. Cobbles are 10mm. [HYTHE FORMATION]	4.40 (1.70)	91.25
Weathered sandstone recovered as very sandy very gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse sandstone. [HYTHE FORMATION]	4.85 (0.45)	90.80
Strong light grey and brown fine grained SANDSTONE. Fractures are extremely closely to closely spaced, vertical, smooth, planar. [HYTHE FORMATION]	5.84 (0.99)	89.81
Weathered sandstone recovered as slightly cobbly silty sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse sandstone. [HYTHE FORMATION]	6.80 (0.96)	88.85
Strong light grey and brown fine grained SANDSTONE. Fractures are extremely closely to closely spaced, vertical, rough, planar. [HYTHE FORMATION]	7.10 (0.30)	88.55
Weathered sandstone recovered as brown silty sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse sandstone. [HYTHE FORMATION]	8.20 (1.10)	87.45
No Recovery.	(2.30)	

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	10.50	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
1.80	10.50	0	Air mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
150	2.50		

WATER ADDED

From	To	Volume (ltr)

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth: 10.50m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

ARCADIS Rotary Borehole Log

BH203

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**95.65**	**28/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611559.58**	**135977.57**	**29/08/2018**	**Sheet 2 of 2**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA				
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend	Depth (Thickness)	Level	Install/ Backfill
								29/08/2018 19:00		No Recovery.		10.50	85.15	▨

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 1.20	1.20 10.50	Inspection Pit Rotary Core	1.80	10.50	0	Air mist							150	2.50					

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
10.50m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Borehole Photography Sheet

BH203

Project
Otterpool Phase 2

Client
Folkestone and Hythe District Council

Job No
10011914

Easting (OS mE)
type

Ground Level (mAOD)
type

Northing (OS mN)
type

Start Date
29/08/2018

End Date
29/08/2018

[EXPLORATORY HOLE NUMBER 203: 1.20m-4.00m]

[EXPLORATORY HOLE NUMBER 203: 4.40m-10.50m]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
Pioneer P60D

Logged By
MT / IT

Checked By
SH

ARCADIS Rotary Borehole Log

BH204

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**106.57**	**03/09/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611644.34**	**135027.14**	**04/09/2018**	**Sheet 1 of 1**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA				Install/ Backfill
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend	Depth (Thickness)	Level	
0.00 - 0.20	ES1	PID	<1ppm					03/09/2018 17:00		MADE GROUND: Grass over brownish grey slightly gravelly clayey fine to medium SAND with frequent rootlets. Gravel is angular to subrounded fine to medium flint, tarmac and concrete.		(0.50)		
												0.50	106.07	
0.50 - 0.70	ES2	PID	<1ppm							Orangish brown clayey fine to medium SAND with occasional pockets of very sandy silt. [HEAD DEPOSITS]		(0.70)		
0.50 - 1.00	B3													
												1.20	105.37	
1.20 - 1.40	ES4	SPT(S)	N=15 (3,3/3,4,4,4)	100				03/09/2018 18:00		Medium dense multicoloured light grey, orangish brown and reddish brown silty fine to medium SAND with 1-3mm bands of clay. [HEAD DEPOSITS]				
1.20 - 1.55	D5	PID	<1ppm					04/09/2018 08:00						
1.20 - 2.20	B6													
2.20 - 2.40	ES7	SPT(S)	N=14 (2,3/3,4,4,3)	100								(2.00)		
2.20 - 2.65	D9	PID	<1ppm											
2.20 - 3.20	B8									Pockets of significant iron staining.				
												3.20	103.37	
3.20 - 3.43	D10	SPT(S)	N>50 (1,4/42,8 for 5mm)	35 30 30	20 20 100	0				Strong bluish grey fine grained SANDSTONE. Fractures are closely to widely spaced, subhorizontal to subvertical, rough, planar. [HYTHE FORMATION]				
		SPT(C)	N>50 (3,22 for 50mm/50 for 30mm)	45 40 40										
				70 60 60										
				80 60 60								(6.80)		
				50 35 35										
				75 55 55										
								04/09/2018 18:00	4.20 8.60			10.00	96.57	

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 1.20 3.20	1.20 3.20 10.00	Inspection Pit Dynamic Sample Rotary Core	3.20	10.00	0	Air mist							116	10.00	128 113 121 116	2.20 3.20 5.00 10.00			

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
10.00m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Borehole Photography Sheet

BH204

Project: **Otterpool Phase 2**
Client: **Folkestone and Hythe District Council**
Job No: **10011914**
Easting (OS mE): **611644.34**
Ground Level (mAOD): **106.57**
Northing (OS mN): **135027.14**
Start Date: **03/09/2018**
End Date: **04/09/2018**

[EXPLORATORY HOLE NUMBER 204: 1.20m-6.00m]

[EXPLORATORY HOLE NUMBER 204: 1.20m-6.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used: **Pioneer P60D**

Logged By: **MT**

Checked By: **SH**

Borehole Photography Sheet

BH204

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**106.57**	**03/09/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611644.34**	**135027.14**	**04/09/2018**

[EXPLORATORY HOLE NUMBER 204: 6.00m-10.00m]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**MT**	**SH**

ARCADIS Rotary Borehole Log

BH206

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**72.06**	**05/09/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**612340.81**	**137026.93**	**06/09/2018**	**Sheet 1 of 1**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS	
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water
0.00 - 0.20	ES8	PID	<1ppm					05/09/2018 14:00	
0.50 - 0.80	ES9	PID	<1ppm						
1.20 - 1.30	ES1	SPT(S)	N=4 (1,1/1,0,1,2)						
1.20 - 1.40	D10	PID	<1ppm						
1.70 - 1.80	ES2	PID	<1ppm	100					
2.20 - 2.30	ES3	SPT(S)	N=14 (2,2/4,3,3,4)						
2.20 - 2.40	D12	PID	<1ppm	100					
3.20 - 3.40	D11	SPT(S)	N=31 (3,5/5,8,9,9)						
3.40 - 3.50	ES4	PID	<1ppm	100					
4.20 - 4.40	D13	SPT(S)	N=44 (6,10/10,11,12,11)						
4.60 - 4.70	ES5	PID	<1ppm	100					
4.60 - 4.80	D14								
5.20 - 5.30	ES6	SPT(S) PID	N>50 (3,3/8,14,16,12 for 20mm) <1ppm			20		05/09/2018 18:00 06/09/2018 08:00	4.20 3.19 4.20 4.89
5.70 - 5.80	ES7	PID	<1ppm	80					
6.50 - 6.70	D15								
		SPT(C)	N>50 (7,10/11,15,21,3 for 5mm)					06/09/2018 11:00	5.20 3.87

STRATA Description	Depth (Thickness)	Level
MADE GROUND: Grass over brown slightly silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium flint, brick, sandstone and concrete. [TOPSOIL]	(0.50) 0.50	71.56
Soft light brown mottled dark brown mottled orange slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint. [HEAD DEPOSITS]	(0.70) 1.20	70.86
Soft orange brown mottled grey silty CLAY. [HEAD DEPOSITS]	(1.00) 2.20	69.86
Medium dense greenish brown mottled orangish brown very clayey fine to coarse SAND. [HEAD DEPOSITS]	(1.20) 3.40	68.66
Dense bluish grey slightly clayey silty fine to coarse SAND. [HEAD DEPOSITS] Coarse flint.	(1.20) 4.60	67.46
Firm dark brown slightly sandy silty CLAY. Sand is fine to coarse. [SANDGATE FORMATION]	(0.60) 5.20	66.86
Very stiff dark brown CLAY. [SANDGATE FORMATION]	(0.50) 5.70	66.36
Very stiff dark brown sandy CLAY. Sand is fine to coarse. [SANDGATE FORMATION]	(1.00) 6.70	65.36

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 1.20 5.20	1.20 5.20 6.70	Inspection Pit Dynamic Sample Rotary Core	5.20	6.70	20	Air mist	05/09/2018 17:00	5.20	20	3.19	4.20		116	6.70	144 144 116	4.20 5.20 6.70			

Remarks

Terminated on designer's instruction.

Termination Depth:
6.70m

AGS
Arcadis Cymru House
St Mellons Business
Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Borehole Photography Sheet

BH206

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**72.06**	**05/09/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**612340.81**	**137026.93**	**06/09/2018**

[EXPLORATORY HOLE NUMBER 206: 1.20m-4.20m]

[EXPLORATORY HOLE NUMBER 206: 1.20- 4.00m SPLIT]

Arcadis Cymru
House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**IT**	**SH**

Borehole Photography Sheet

BH206

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**72.06**	**05/09/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**612340.81**	**137026.93**	**06/09/2018**

[EXPLORATORY HOLE NUMBER 206: 4.20m-6.70m]

[EXPLORATORY HOLE NUMBER 206: 4.20- 6.70m SPLIT]

Arcadis Cymru House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**IT**	**SH**

ARCADIS Rotary Borehole Log

BH207

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **68.29**	Start Date **06/09/2018**	Scale **1:50**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611952.04**	Northing (OS mN) **136900.84**	End Date **06/09/2018**	**Sheet 1 of 1**

SAMPLES / TESTS

Depth	Type/ No.	Type/ No.	Results
0.00 - 0.20	ES1	PID	<1ppm
0.50 - 0.70	ES2	PID	<1ppm
0.50 - 1.00	B3		
1.20 - 1.30	ES4	SPT(S)	N=5 (1,1/1,1,1,2)
1.20 - 1.40	D15	PID	<1ppm
1.20 - 1.65	D11		
1.70 - 1.80	ES5	PID	<1ppm
2.00 - 2.10	ES6		
2.20 - 2.30	ES7	SPT(S)	N=15 (1,1/3,4,4,4)
2.20 - 2.40	D16	PID	<1ppm
2.20 - 2.65	D12		
2.60 - 2.70	ES8	PID	<1ppm
3.20 - 3.65	D13	SPT(S)	N=25 (2,2/4,5,6,10)
3.20 - 4.00	B10		
3.40 - 3.50	ES9	PID	<1ppm
4.00 - 4.36	D14	SPT(S)	N>50 (16,9 for 10mm/17,13,12,8 for 40mm)
		SPT(C)	N>50 (10,15 for 20mm/50 for 40mm)

DRILL LOG

Run	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%
1.20 - 2.20	100		
2.20 - 3.20	100		
3.20 - 4.00	100		
4.00 - 5.00	80		20

PROGRESS

Date Time	Casing	Water
06/09/2018 13:00		
06/09/2018 18:00	4.00	1.63
07/09/2018 08:00	4.00	3.78

STRATA

Description	Depth (Thickness)	Level
Grass over firm brown mottled orange brown slightly sandy CLAY. [TOPSOIL]	(0.50) 0.50	67.79
Soft orange brown mottled light brown silty sandy CLAY. [ALLUVIUM]	(0.70) 1.20	67.09
Soft grey mottled orange brown silty CLAY. [ALLUVIUM]	(0.80) 2.00	66.29
Soft grey mottled light brown mottled orange brown slightly silty sandy gravelly CLAY with occasional 4cm cobbles. Gravel is angular to subangular fine to coarse flint. [HEAD DEPOSITS]	(0.20) 2.20	66.09
Soft brown mottled light brown sandy gravelly CLAY. Gravel is subangular to subrounded fine flint. [HEAD DEPOSITS]	(0.32) 2.52	65.77
Medium dense dark brown slightly silty slightly gravelly clayey SAND. Gravel is subangular to subrounded fine sandstone. [HEAD DEPOSITS]	(0.88) 3.40	64.89
Medium dense dark brown mottled dark blue gravelly silty very sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine sandstone. [HEAD DEPOSITS]	(0.60) 4.00	64.29
No Recovery.	(0.30) 4.30	63.99
Weathered sandstone recovered as dark greenish brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse sandstone. [HYTHE FORMATION]	(0.30) 4.60	63.69
Dark greenish brown fine grained SANDSTONE. [HYTHE FORMATION]	(0.40) 5.00	63.29

DRILLING TECHNIQUE

Depth Top	Depth Base	Type
0.00	1.20	Inspection Pit
1.20	4.00	Dynamic Sample
4.00	5.00	Rotary Core

FLUSH DETAILS

From	To	Rtn %	Flush Type
4.00	5.00	20	Air mist

WATER OBSERVATIONS

Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed
06/09/2018 14:40	2.20	20	1.63	0.00	4.00

HOLE/CASING DIAMETER

Hole Dia.	Depth	Casing Dia.	Depth
116	5.00	144	4.00

WATER ADDED

From	To	Volume (ltr)

Remarks

Terminated on designer's instruction.

Termination Depth:
5.00m

AGS Arcadis Cymru House St Mellons Business Park Cardiff CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Borehole Photography Sheet

BH207

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**68.29**	**06/09/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611952.04**	**136900.84**	**06/09/2018**

[EXPLORATORY HOLE NUMBER 207: 1.20m-4.00m]

[EXPLORATORY HOLE NUMBER 207: 1.20- 4.00m SPLIT]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**IT**	**SH**

ARCADIS Rotary Borehole Log

BH208

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**65.56**	**15/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611187.45**	**137527.62**	**17/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS	
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water
0.00 - 0.10	ES1	PID	<1ppm					16/08/2018 09:00	
0.40 - 0.60	B2	PID	<1ppm						
0.40 - 0.60	D3								
0.40 - 0.60	ES4								
1.00 - 1.20	ES5	PID	<1ppm						
1.20 - 1.65	U6								
1.20 - 1.65	UT6								
				89					
1.70 - 1.90	ES7	PID	<1ppm						
2.00 - 2.10	D8	SPT(S)	N=8 (1,1/2,2,2,2)						
2.00 - 2.10	ES9	PID	<1ppm						
2.00 - 2.45	D26								
2.00 - 2.50	B10								
2.50 - 2.60	D12	PID	<1ppm	100					
2.50 - 2.60	ES11								
2.90 - 3.00	D14	PID	<1ppm						
2.90 - 3.00	ES13	SPT(S)	N=10 (1,1/2,2,3,3)						
2.90 - 3.80	B15								
3.00 - 3.45	D27								
				100					
3.80 - 4.00	ES16	PID	<1ppm						
4.00 - 4.45	D28	SPT(S)	N=29 (4,4/6,7,7,9)						
4.00 - 5.00	B18	PID	<1ppm						
4.50 - 4.60	ES17	PID	<1ppm	100					
5.00 - 5.10	D20	SPT(S)	N>50			0			
5.00 - 5.10	ES19	PID	(5,13/12,12,15,11 for						
5.00 - 5.45	D29		45mm)						
5.00 - 5.50	B21		<1ppm						
5.50 - 5.70	D23	PID	<1ppm	100					
5.50 - 5.70	ES22								
5.50 - 5.90	B24								
5.90 - 6.00	ES25	PID	<1ppm						
								16/08/2018 16:00	6.00 4.80
								17/08/2018 09:00	6.00 4.80

STRATA	Depth (Thickness)	Level
Description		
Grass over brownish grey slightly clayey fine to medium SAND with rare charcoal. [TOPSOIL]	(0.40)	
	0.40	65.16
Soft orangish brown slightly sandy silty CLAY with occasional rootlets (1mm) and black staining. Sand is fine to medium. [HEAD DEPOSITS]	(1.60)	
	2.00	63.56
Firm orangish brown mottled grey sandy CLAY with occasional charcoal. Rare subangular coarse gravel of flint. Sand is fine to coarse. [HEAD DEPOSITS]	(0.90)	
	2.90	62.66
Firm laminated light grey and orangish brown sandy tending to very sandy CLAY. [HEAD DEPOSITS] 10mm pockets of soft very light brown and orangish brown clay.	(0.90)	
	3.80	61.76
Medium dense dark greenish grey slightly silty fine to medium glauconitic SAND. [HEAD DEPOSITS] Becoming more silty.	(1.20)	
	5.00	60.56
Very dense multicoloured red brown, orangish brown, dark grey slightly silty clayey fine to coarse SAND. [SANDGATE FORMATION] Iron stone and staining.	(0.50)	
	5.50	60.06
Very dense dark grey fine SAND. [SANDGATE FORMATION]	(0.40)	
	5.90	59.66
Very dense dark grey slightly silty fine SAND. [SANDGATE FORMATION]	6.00	59.56

DRILLING TECHNIQUE			FLUSH DETAILS				WATER OBSERVATIONS						HOLE/CASING DIAMETER				WATER ADDED		
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00 1.20	1.20 6.00	Inspection Pit Dynamic Sample	5.00	6.00	0	Air mist							113	6.00	128	6.00			

Remarks

Terminated due to Health and Safety concerns. Groundwater not encountered.

Termination Depth:
6.00m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Borehole Photography Sheet

BH208

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
611187.45

Ground Level (mAOD)
65.56
Northing (OS mN)
137527.62

Start Date
15/08/2018
End Date
17/08/2018

[EXPLORATORY HOLE NUMBER 208: 1.20m-4.00m]

[EXPLORATORY HOLE NUMBER 208: 1.20- 4.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
Pioneer P60D

Logged By
MT

Checked By
SH

Borehole Photography Sheet

BH208

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**65.56**	**15/08/2018**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611187.45**	**137527.62**	**17/08/2018**

[EXPLORATORY HOLE NUMBER 208: 4.00m-6.00m]

[EXPLORATORY HOLE NUMBER 208: 4.00- 6.00m SPLIT]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Pioneer P60D	**MT**	**SH**

ARCADIS Rotary Borehole Log

BH209

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**57.88**	**24/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**610176.70**	**137633.24**	**27/08/2018**	**Sheet 1 of 2**

SAMPLES		TESTS		DRILL LOG				PROGRESS	
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%	Water Strikes	Date Time	Casing Water
0.00 - 0.20	ES1	PID	<1ppm					23/08/2018 08:00	
0.30 - 0.50	B2	PID	<1ppm						
0.30 - 0.50	D4								
0.30 - 0.50	ES3								
0.90 - 1.00	D6	PID	<1ppm						
0.90 - 1.00	ES5								
1.10 - 1.20	B7	PID	<1ppm						
1.10 - 1.20	D8	SPT(S)	N=3 (1,0/1,1,1,0)						
1.10 - 1.20	ES9								
1.70 - 2.00	ES10	PID	<1ppm	100					
1.80 - 2.00	D11								
		SPT(S)	N=4 (1,0/1,1,1,1)						
2.40 - 2.55	ES12	PID	<1ppm						
2.70 - 3.00	D13			100					
3.00 - 3.10	ES14	PID	<1ppm						
		SPT(S)	N=10 (1,2/2,2,3,3)						
3.76 - 4.00	D15	PID	<1ppm						
3.76 - 4.00	ES16			100				23/08/2018 18:00	2.00 2.00
								24/08/2018 08:00	2.00 3.00
		SPT(S)	N=19 (2,2/4,4,5,6)						
4.80 - 4.90	ES17	PID	<1ppm						
5.00 - 5.20	D18			100					
		SPT(S)	N=23 (4,4/5,5,6,7)						
5.80 - 5.90	ES19	PID	<1ppm						
6.00 - 6.50	B20			100					
		SPT(S)	N=22 (4,4/5,5,6,6)						
6.80 - 6.90	ES21	PID	<1ppm	100					
7.40 - 7.50	D22								
		SPT(S)	N=27 (5,5/6,6,7,8)						
7.80 - 7.90	ES23	PID	<1ppm	100					
8.40 - 8.50	D24								
		SPT(S)	N=30 (5,6/7,7,7,9)						
8.80 - 8.90	ES25	PID	<1ppm	100					
9.40 - 9.50	D26								
		SPT(S)	N=31 (7,7/7,7,8,9)						
9.80 - 9.90	ES27	PID	<1ppm	100					

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Brown very clayey fine to medium SAND. [TOPSOIL]		(0.30) 0.30	57.58	
Soft to firm grey mottled orange brown slightly gravelly sandy CLAY with occasional black stainings. Gravel is subangular fine to coarse sandstone, ironstone. [ALLUVIUM] Slow water seepage.		(1.15) 1.45	56.43	
Very loose light brown mottled dark brown clayey very silty fine to coarse SAND. [ALLUVIUM] Pocket of peat.		(1.15) 2.60	55.28	
Soft brown to dark brown silty very sandy organic CLAY. Sand is fine to coarse. [ALLUVIUM]		(1.16) 3.76	54.12	
Firm fissured light grey mottled blue grey slightly silty CLAY. Fissures are closely spaced orientated subhorizontal to subvertical. [WEALD CLAY FORMATION]		(0.74) 4.50	53.38	
Firm to stiff structureless blue grey silty CLAY. [WEALD CLAY FORMATION] 2cm flint surrounded by orange brown silt.		(6.00)		

DRILLING TECHNIQUE			FLUSH DETAILS			
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type
0.00 1.10	1.10 10.50	Inspection Pit Dynamic Sample	3.76	10.50		Air mist

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER				WATER ADDED		
Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
113	10.50	113 113	2.00 7.00			

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
10.50m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT / IT**	**SH**

ARCADIS **Rotary Borehole Log** **BH209**

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**57.88**	**24/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**610176.70**	**137633.24**	**27/08/2018**	**Sheet 2 of 2**

SAMPLES		TESTS		DRILL LOG			Water Strikes	PROGRESS		STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Type/ No.	Results	TCR% SCR% RQD%	FI (min ave max)	Flush Rtn%		Date Time	Casing Water	Description	Legend			
10.40 - 10.50	D28	SPT(S)	N=36 (8,9/8,8,9,11)					24/08/2018 18:00	7.00 8.00	Firm to stiff structureless blue grey silty CLAY. [WEALD CLAY FORMATION]		10.50	47.38	

DRILLING TECHNIQUE			FLUSH DETAILS			
Depth Top	Depth Base	Type	From	To	Rtn %	Flush Type
0.00 1.10	1.10 10.50	Inspection Pit Dynamic Sample	3.76	10.50		Air mist

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
113	10.50	113 113	2.00 7.00

WATER ADDED		
From	To	Volume (ltr)

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
10.50m

AGS Arcadis Cymru House St Mellons Business Park Cardiff CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mAOD).

Equipment Used	Contractor	Logged By	Checked By
Pioneer P60D	**Arcadis Consulting (UK) Ltd**	**MT / IT**	**SH**

Borehole Photography Sheet

BH209

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
610176.70

Ground Level (mAOD)
57.88
Northing (OS mN)
137633.24

Start Date
24/08/2018
End Date
24/08/2018

[EXPLORATORY HOLE NUMBER 209: 1.20m-4.50m]

[EXPLORATORY HOLE NUMBER 209: 4.50m-7.50m]

[EXPLORATORY HOLE NUMBER 209: 7.50m-10.50m]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
Pioneer P60D

Logged By
MT / IT

Checked By
SH

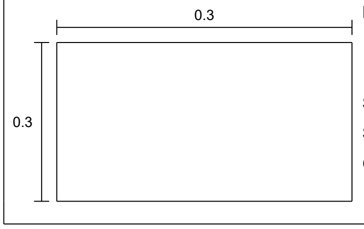
ARCADIS Inspection Pit Log

HD201

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **104.45**	Start Date **29/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611814.50**	Northing (OS mN) **135121.40**	End Date **29/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.10	ES1	0.10	PID	<1ppm		Soft dark grey sandy slightly gravelly SILT, with abundant roots and rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint and rare glass. [TOPSOIL]		(0.10) 0.10	104.35	
0.50 - 0.60	ES2	0.60	PID	<1ppm		MADE GROUND: Soft to firm light grey mottled orange sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. 1 cm plastic coated wire.		(0.90)		
0.90 - 1.00	ES3	1.00	PID	<1ppm				1.00	103.45	

PLAN DETAILS



Long Axis Orientation:

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Inspection pit terminated at scheduled depth of 1.00m bgl. Groundwater not encountered.

Termination Depth:
1.00m

AGS

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Hand Tools	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

HD201

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**type**	**29/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611814.50**	**135121.40**	**29/08/18**

[HAND PIT NUMBER 201: GL- 1.0m]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
Hand Tools	**MT**	**SH**

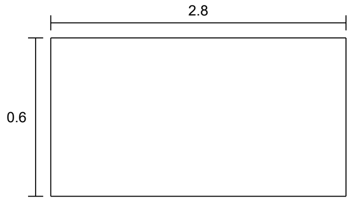
ARCADIS Trial Pit Log

TP201

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**97.83**	**23/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611084.23**	**136091.54**	**23/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20 0.20 - 0.40 0.20 - 0.40	ES B1 ES2	0.20	PID	<1ppm		MADE GROUND: Soft brown slightly sandy slightly gravelly organic CLAY. Sand is fine to course. Gravel is subangular to rounded fine to medium of flint.		(0.40)		
								0.40	97.43	
0.60 - 0.80 0.60 - 0.80	B3 ES4	0.60	PID	<1ppm		Soft to firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to medium of flint. Rare pockets of black clay. Relic roots noted throughout. [HEAD DEPOSITS]				
1.20 1.20 - 1.30 1.20 - 1.30	ES B5 ES6	1.20	PID	<1ppm						
1.60 - 1.80 1.60 - 1.80	B7 ES8	1.60	PID	<1ppm				(2.30)		
2.10 - 2.30 2.10 - 2.30	B9 ES10	2.10	PID	<1ppm						
								2.70	95.13	
2.80 - 3.00 2.80 - 3.00	B11 ES12	2.80	PID	<1ppm		Soft light brown mottled grey very sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]		(0.60)		
								3.30	94.53	
3.30 - 3.40	B13					Weak light grey LIMESTONE. [HYTHE FORMATION]		(0.10)		
								3.40	94.43	

PLAN DETAILS



Long Axis Orientation:

120

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Trial pit terminated on bed rock. Groundwater not encountered.

Termination Depth:

3.40m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**SH**	**SH**

Trial Pit Photography Sheet

TP203

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**97.70**	**31/08/18**
Client	**Easting (OS mE)**	**Northing (OS mN)**	**End Date**
Folkestone and Hythe District Council	**611413.92**	**135926.65**	**31/08/18**

[TRIAL PIT NUMBER 203: GL- 1.30m]

[TRIAL PIT NUMBER 203: SPOIL]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	MT	SH

ARCADIS Trial Pit Log

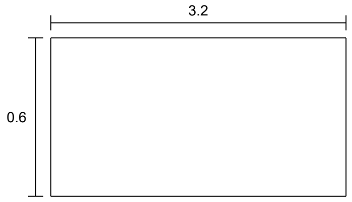
TP202

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**97.39**	**23/08/2018**	**1:25**
Client	**Easting (OS mE)**	**Northing (OS mN)**	**End Date**	
Folkestone and Hythe District Council	**611272.97**	**136042.29**	**23/08/2018**	**Sheet 1 of 1**

SAMPLES Depth	SAMPLES Type/ No.	TESTS Depth	TESTS Type/ No.	TESTS Results	Water Strikes
0.20 - 0.30 0.20 - 0.30	B1 ES2	0.20	PID	<1ppm	
0.40 - 0.50 0.40 - 0.50	B3 ES4	0.40	PID	<1ppm	
1.00 - 1.10 1.00 - 1.10	B5 ES6	1.00	PID	<1ppm	
1.60 - 1.70 1.60 - 1.70	B7 ES8	1.60	PID	<1ppm	
2.00 - 2.20 2.00 - 2.20	B9 ES10	2.00	PID	<1ppm	
2.50 - 2.60	B11				

STRATA Description	Depth (Thickness)	Level
MADE GROUND: Grass over soft brown slightly sandy slightly gravelly organic rich CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to medium of flint. Rare roots and rootlets. Occasional fragments of metal reinforcement (5x50mm)	(0.30) 0.30	97.09
Firm to stiff light brown to brown slightly sandy CLAY. Sand is fine to coarse [HEAD DEPOSITS]	(1.30) 1.60	95.79
Firm light grey mottled light brown very sandy CLAY with high cobble content. Sand is fine to medium. Cobbles are angular to subangular of weak light grey limestone. [HEAD DEPOSITS]	(0.90) 2.50	94.89
Weak light grey LIMESTONE with brown staining [HYTHE FORMATION]	(0.10) 2.60	94.79

PLAN DETAILS



Long Axis Orientation:

145

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Trial pit terminated on bedrock. Groundwater not encountered.

Termination Depth:

2.60m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**SH**	**SH**

Trial Pit Photography Sheet

TP201

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**97.83**	**23/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611084.23**	**136091.54**	**23/08/18**

[TRIAL PIT NUMBER 201: GL- 3.40m]

[TRIAL PIT NUMBER 201: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**SH**	**SH**

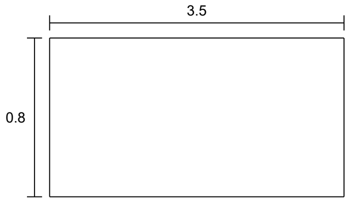
ARCADIS Trial Pit Log

TP203

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**97.70**	**31/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611413.92**	**135926.65**	**31/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.10	ES1	0.00	PID	<1ppm		Grass over soft dark grey sandy CLAY with occasional roots and rootlets. Sand is fine to coarse. [TOPSOIL]		(0.30)		
0.30 - 0.40 0.30 - 0.40	B2 ES3	0.30	PID	<1ppm		MADE GROUND: Light brown clayey gravelly fine SAND with occasional roots and rootlets (3mm). Gravel is subangular to subrounded fine to coarse brick, chalk and tarmac.		0.30	97.40	
0.50 - 0.70 0.50 - 0.70	B4 ES5	0.50	PID	<1ppm						
0.70	ES5							(1.00)		
1.00 1.00 - 1.10	B6 ES6asb									
								1.30	96.40	

PLAN DETAILS



Long Axis Orientation:

120

Shoring / Support: None

Stability: Good

Groundwater (description):

Remarks

Terminated due to hard strata and possible asbestos (sample ES6asb).

Termination Depth:

1.30m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP202

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**97.39**	**23/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611272.97**	**136042.29**	**23/08/18**

[TRIAL PIT NUMBER 202: GL- 2.60m]

[TRIAL PIT NUMBER 202: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**SH**	**SH**

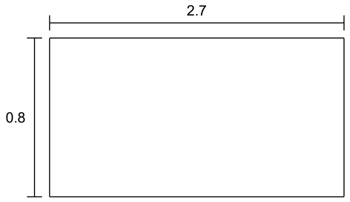
ARCADIS Trial Pit Log

TP204

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **102.05**	Start Date **30/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611359.31**	Northing (OS mN) **135749.83**	End Date **30/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.00 - 0.20	ES1	0.00	PID	<1ppm		Grass over soft dark grey sandy CLAY with occasional roots and rootlets. Sand is fine to coarse. [TOPSOIL]		(0.40)		
0.40 - 0.50 0.43 - 0.50	ES3 B2	0.40	PID	<1ppm		MADE GROUND: Grey brown very gravelly silty fine to coarse SAND. Gravel is subangular fine to coarse of tarmac, chalk, sandstone, brick, metal and plastic.		0.40	101.65	
1.00 - 1.20 1.00 - 1.20	B4 ES5	1.00	PID	<1ppm				(1.50)		
								1.90	100.15	

PLAN DETAILS



Long Axis Orientation:

90

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:

1.90m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP204

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**102.05**	**30/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611359.31**	**135749.83**	**30/08/18**

[TRIAL PIT NUMBER 204: GL- 1.90m]

[TRIAL PIT NUMBER 204: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

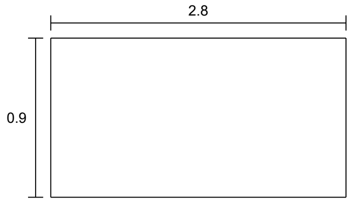
Trial Pit Log

TP205

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**107.68**	**30/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611305.36**	**135389.95**	**30/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.20	ES1	0.00	PID	<1ppm		Soft dark grey sandy CLAY with occasional roots and rootlets. Sand is fine to coarse. [TOPSOIL]		(0.20) 0.20	107.48	
0.20 - 0.30 0.20 - 0.30	B2 ES3	0.20	PID	<1ppm		MADE GROUND: Yellowish brown gravelly silty fine to medium SAND. Gravel is angular to subangular fine to coarse sandstone, flint and brick.				
0.70 - 0.80 0.70 - 0.80	B4 ES5	0.70	PID	<1ppm				(1.00)		
		1.00	PID	<1ppm						
1.10 - 1.20 1.10 - 1.20	B6 ES7							1.20	106.48	

PLAN DETAILS



Long Axis Orientation:

97

Shoring / Support: None

Stability: Poor

Groundwater (description):

Remarks

Terminated due to ground instability. Groundwater not encountered.

Termination Depth:

1.20m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP205

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**107.68**	**30/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611305.36**	**135389.95**	**30/08/18**

[TRIAL PIT NUMBER 205: GL- 1.20m]

[TRIAL PIT NUMBER 205: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

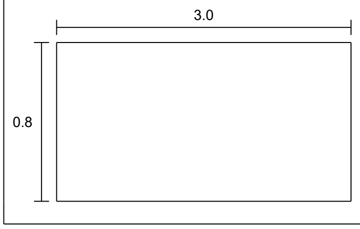
ARCADIS Trial Pit Log

TP206

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**94.94**	**31/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611554.23**	**136009.84**	**31/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.15	ES1	0.00	PID	<1ppm		Black silty fine to coarse SAND with occasional rootlets. [TOPSOIL]		(0.15) 0.15	94.79	
0.15 - 0.25 0.15 - 0.25	B2 ES3	0.15	PID	<1ppm		Orange brown clayey fine to coarse SAND. [HEAD DEPOSITS]		(0.25) 0.40	94.54	
						Weathered brown SANDSTONE recovered as sandy gravelly COBBLES. Sand is fine to coarse. Gravel is angular fine to coarse sandstone. [HYTHE FORMATION]		(0.30) 0.70	94.24	

PLAN DETAILS



Long Axis Orientation:

110

Shoring / Support: None

Stability: Good

Groundwater (description):

Remarks

Terminated on bedrock. Groundwater not encountered.

Termination Depth:

0.70m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

ARCADIS

Trial Pit Photography Sheet

TP206

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**94.94**	**31/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611554.23**	**136009.84**	**31/08/18**

[TRIAL PIT NUMBER 206: GL- 0.70m]

[TRIAL PIT NUMBER 206: SPOIL]

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

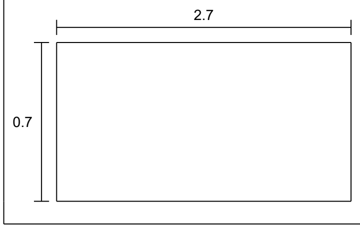
ARCADIS Trial Pit Log

TP208

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**106.42**	**24/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611346.30**	**135066.67**	**24/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.15 0.00 - 0.15	B1 ES2	0.00	PID	<1ppm		Grass over grey brown slightly gravelly clayey fine to medium SAND. Gravel is subangular to subrounded fine to medium flint. [TOPSOIL]		(0.20) 0.20	106.22	
0.20 - 0.40 0.20 - 0.40	B3 ES4	0.20	PID	<1ppm		MADE GROUND: Brown slightly gravelly clayey fine SAND. Gravel is subangular to subrounded fine to medium flint with rare glass.		(0.80) 1.00	105.42	
1.00 - 1.20 1.00 - 1.20	B5 ES6	1.00	PID	<1ppm		Brown mottled orange brown silty fine to coarse SAND. [HYTHE FORMATION]		(0.50) 1.50	104.92	
1.50 - 1.70 1.50 - 1.70	B7 ES8	1.50	PID	<1ppm		Light brown mottled light grey slightly clayey fine to medium SAND with rare sandstone. [HYTHE FORMATION]		(0.90)		
2.20 - 2.40 2.20 - 2.40	B9 ES10	2.20	PID	<1ppm		Becoming mottled orange brown.				
								2.40	104.02	
						Weathered brown SANDSTONE recovered as subangular cobbles and boulders of sandstone on clayey sand matrix. [HYTHE FORMATION]		(0.20) 2.60	103.82	

PLAN DETAILS



Long Axis Orientation:

72

Shoring / Support: None

Stability: Good

Groundwater (description):

Remarks

Terminated on bedrock. Groundwater not encountered.

Termination Depth:

2.60m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP208

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**106.42**	**24/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611346.30**	**135066.67**	**24/08/18**

[TRIAL PIT NUMBER 208: GL- 2.60m]

[TRIAL PIT NUMBER 208: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

ARCADIS Trial Pit Log

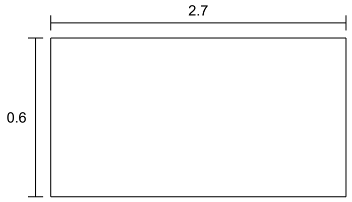
TP209

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **106.34**	Start Date **24/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611499.37**	Northing (OS mN) **135018.78**	End Date **24/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.20	ES1	0.00	PID	<1ppm	
0.20 - 0.40	B3	0.20	PID	<1ppm	
0.20 - 0.40	ES2				
0.90 - 1.00	ES4	0.90	PID	<1ppm	
1.40 - 1.50	B5				
1.40 - 1.50	ES6				
1.80 - 2.00	B7	1.80	HV(1)	25(10)kPa	
1.80 - 2.00	D9	1.80	HV(2)	26(10)kPa	
1.80 - 2.00	ES8	1.80	HV(3)	28(12)kPa	

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Grass over brownish grey slightly gravelly clayey fine to medium SAND with frequent rootlets. Gravel is subangular to subrounded fine to medium flint. [TOPSOIL]		(0.20) 0.20	106.14	
Greyish brown very silty fine SAND. [HYTHE FORMATION]		(0.90) 1.10	105.24	
Brown mottled orange clayey fine to coarse SAND. [HYTHE FORMATION]		(0.50) 1.60	104.74	
Soft orangish brown mottled grey very sandy SILT. Sand is fine to coarse. [HYTHE FORMATION]		(0.20) 1.80	104.54	
Soft light brown mottled orangish brown sandy clayey SILT with low cobble content. Sand is fine to coarse. Cobbles are subangular to subrounded sandstone. [HYTHE FORMATION] Becoming silty sandy CLAY.		(0.55) 2.35	103.99	

PLAN DETAILS



Long Axis Orientation:

165

Shoring / Support: None

Stability: Poor

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:

2.35m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP209

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**106.34**	**24/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611499.37**	**135018.78**	**24/08/18**

[TRIAL PIT NUMBER 209: GL- 2.35m]

[TRIAL PIT NUMBER 209: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

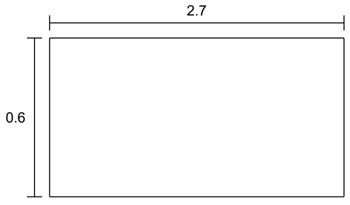
ARCADIS Trial Pit Log

TP210

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **106.43**	Start Date **28/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611704.38**	Northing (OS mN) **135114.52**	End Date **28/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.20	ES1	0.00	PID	<1ppm		Grass over grey clayey fine to medium SAND with frequent 1 mm rootlets. Rare charcoal. [TOPSOIL]		(0.30)		
0.30 - 0.40 0.30 - 0.40	B2 ES3	0.30	PID	<1ppm		Very stiff light brown slightly gravelly slightly sandy SILT with frequent 1mm rootlets. Sand is fine to coarse. Gravel is subrounded fine to medium flint. [HEAD DEPOSITS]		0.30	106.13	
0.80 - 0.90 0.80 - 0.90	B4 ES5	0.80	PID	<1ppm				(1.00)		
						Becoming grey mottled light brown and orangish brown with rare charcoal.				
1.00 - 1.10 1.00 - 1.10	B6 ES7	1.00	PID	<1ppm						
1.30 - 1.40 1.30 - 1.40	B8 ES9					Stiff orange brown mottled grey very sandy SILT with frequent pockets (100mm) of brown clay. Sand is fine to coarse. [HEAD DEPOSITS]		1.30	105.13	
		1.40	PID	<1ppm				(0.50)		
1.80 - 1.90 1.80 - 1.90	B10 ES11					Stiff light brown mottled orange and red very sandy SILT. Sand is fine to coarse. [HEAD DEPOSITS]		1.80	104.63	
								(0.70)		
2.40 - 2.50 2.40 - 2.50	B12 ES13	2.40	PID	<1ppm						
								2.50	103.93	

PLAN DETAILS



Long Axis Orientation:

114

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.50m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP210

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**106.43**	**28/08/18**
Client	**Easting (OS mE)**	**Northing (OS mN)**	**End Date**
Folkestone and Hythe District Council	**611704.38**	**135114.52**	**28/08/18**

[TRIAL PIT NUMBER 210: GL- 2.5m]

[TRIAL PIT NUMBER 210: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

ARCADIS Design & Consultancy for natural and built assets

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP210

Trial Pit Details

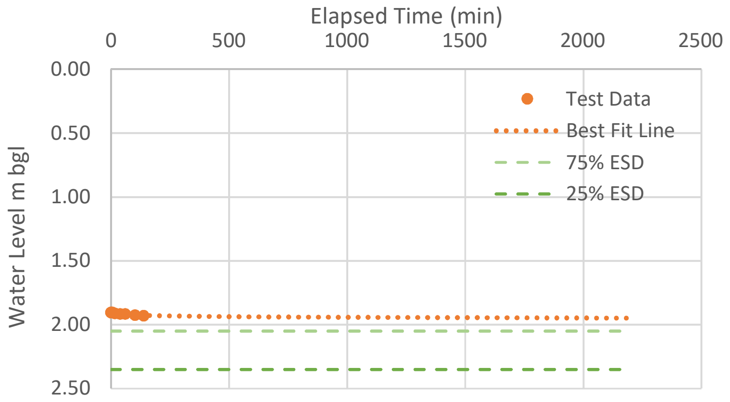
	Test 1	Test 2	Test 3
Depth	2.50		
Width	0.65		
Length	2.70		

Ground Level	106.43	mAOD
Coordinates	611704.38	mE
	135114.52	mN

Date Excavated	28/08/2018
Date Tested	28/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.90	75% esd (mbgl)	2.05
1	1.91	50% esd (mbgl)	2.20
2	1.91	25% esd (mbgl)	2.35
3	1.91	A_{s50} (m^2)	3.77
7	1.91	V_{p75-25} (m^3)	0.53
17	1.91	t_{75} (min)	6.15E+08
40	1.92	t_{25}(min)	2.39E+23
61	1.92	Data Fit R^2	0.808
103	1.93		
139	1.93		

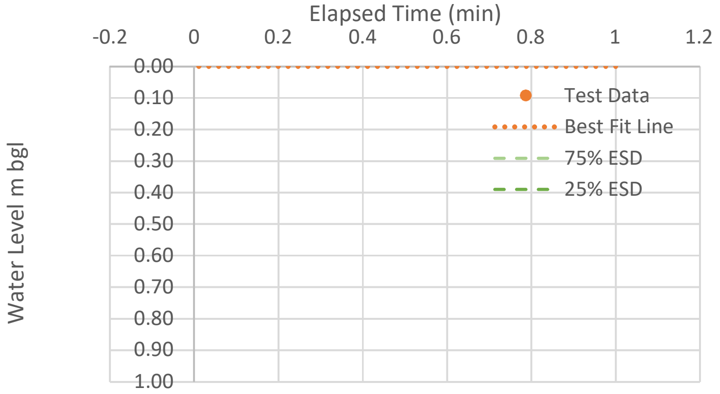


Infiltration rate f (ms^{-1}) **NOT PERMEABLE**

Total effective storage depth (esd) (m) 0.60

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

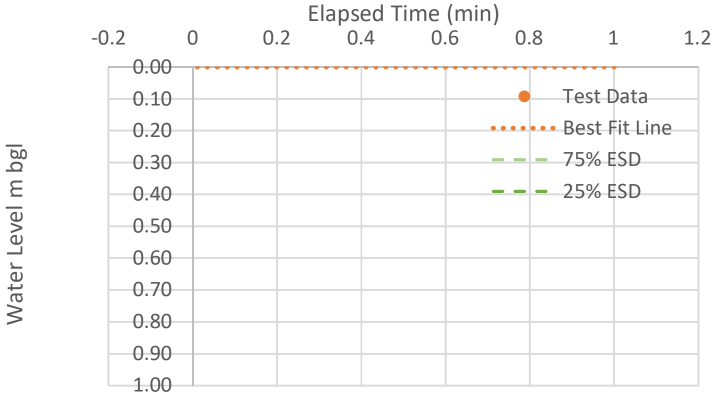


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes:	Logged MT	Checked SH

ARCADIS Trial Pit Log

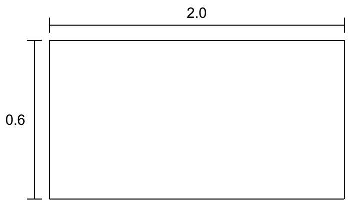
TP211

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **101.70**	Start Date **28/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611768.81**	Northing (OS mN) **135322.39**	End Date **28/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.20	ES1	0.00	PID	<1ppm	
0.30 - 0.40	B2	0.30	PID	<1ppm	
0.30 - 0.40	ES3				
0.65 - 0.80	B4				
0.65 - 0.90	ES5				
		0.80	PID	<1ppm	
1.30 - 1.40	B6				
1.30 - 1.40	ES7				
		1.40	PID	<1ppm	
1.90 - 2.00	B8	1.90	PID	<1ppm	
1.90 - 2.00	ES9				

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Grass over brown grey gravelly clayey fine to medium SAND. Gravel is angular to subrounded fine to coarse flint and chalk. [TOPSOIL]		(0.30) 0.30	101.40	
Very stiff orange brown very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.35) 0.65	101.05	
Stiff yellow brown mottled orange and black slightly gravelly slightly silty slightly sandy CLAY with 5mm pockets of clay. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. [HEAD DEPOSITS] Sandstone bands.		(1.25) 1.90	99.80	
Extremely weathered weak yellowish brown SANDSTONE recovered as brown clayey fine SAND. [HYTHE FORMATION]		(0.15) 2.05	99.65	

PLAN DETAILS



Long Axis Orientation:

120

Shoring / Support: None

Stability: Good

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.05m

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP211

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**101.70**	**28/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611768.81**	**135322.39**	**28/08/18**

[TRIAL PIT NUMBER 211: GL- 2.05m]

[TRIAL PIT NUMBER 211: SPOIL]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP211

Trial Pit Details

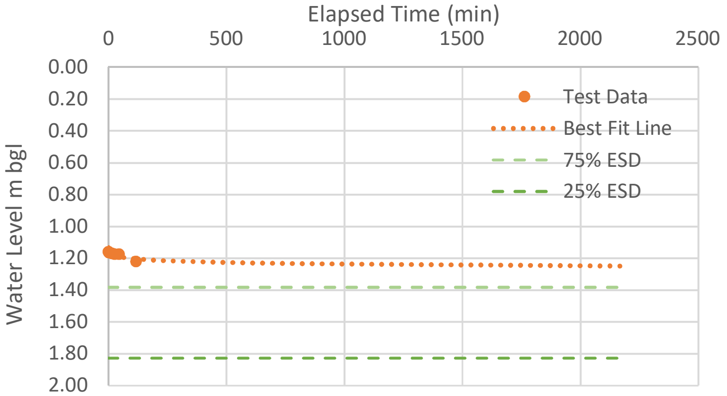
	Test 1	Test 2	Test 3
Depth	2.05		
Width	0.65		
Length	2.50		

Ground Level	101.70	mAOD
Coordinates	611768.81	mE
	135322.39	mN

Date Excavated	28/08/2018
Date Tested	28/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.16	75% esd (mbgl)	1.38
1	1.16	50% esd (mbgl)	1.61
2	1.16	25% esd (mbgl)	1.83
3	1.17	A_{s50} (m^2)	4.43
5	1.17	V_{p75-25} (m^3)	0.72
7.3	1.17	t_{75} (min)	6690216
17.3	1.17	t_{25}(min)	2.62E+16
27	1.18	Data Fit R^2	0.659
46	1.18		
118	1.22		

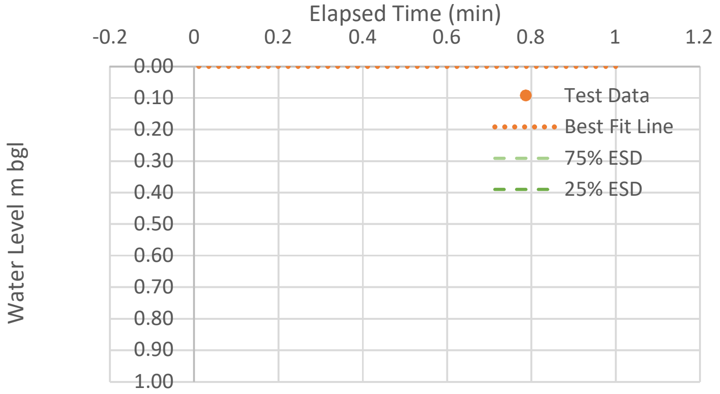


Infiltration rate f (ms^{-1}) **NOT PERMEABLE**

Total effective storage depth (esd) (m) 0.89

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

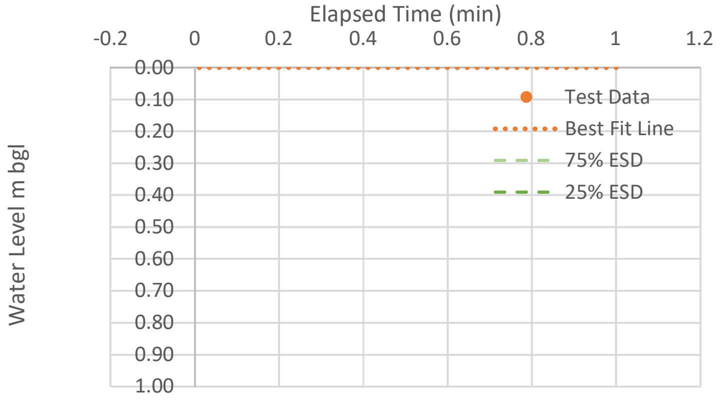


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes: Minor Collapse	Logged MT	Checked SH

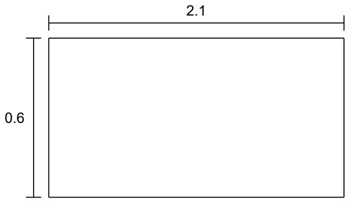
ARCADIS Trial Pit Log

TP213

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **84.34**	Start Date **21/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **612827.41**	Northing (OS mN) **136317.89**	End Date **21/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.00		0.00	PID	<1ppm		Grass over soft dark brown sandy slightly gravelly organic rich CLAY. Sand is fine to medium. Gravel is subangular to rounded medium to coarse flint. Rare rootlets noted. [TOPSOIL]		(0.30)		
0.00	ES									
0.00 - 0.30	B1									
0.00 - 0.30	ES2									
0.30 - 0.50	B3	0.30	PID	<1ppm		Firm light brown mottled orangish brown very gravelly CLAY. Gravel is subangular to rounded fine to coarse of flint. [SANDGATE FORMATION]		0.30	84.04	
0.30 - 0.50	ES4									
								(0.70)		
						1no pocket (0.20 x 0.20m) of soft orange brown sandy CLAY.				
1.00	D5	1.00	PID	<1ppm		Soft light brown mottled orangish brown sandy silty CLAY. Sand is fine to coarse. [SANDGATE FORMATION]		1.00	83.34	
1.00 - 1.20	B5	1.00	HV(1)	35(30)kPa						
1.00 - 1.20	ES6	1.01	HV(2)	40(30)kPa						
		1.02	HV(3)	60(50)kPa						
1.20 - 1.50	B7	1.20	PID	<1ppm						
1.20 - 1.50	ES8									
								(0.80)		
		1.50	HV(4)	30(25)kPa						
		1.51	HV(5)	40(35)kPa						
		1.52	HV(6)	50(45)kPa						
1.80 - 2.00	B9	1.80	PID	<1ppm		Firm dark grey mottled orangish brown slightly sandy CLAY. Sand is fine to coarse. [SANDGATE FORMATION]		1.80	82.54	
1.80 - 2.00	ES10									
2.00 - 2.25	B11	2.00	PID	<1ppm						
2.00 - 2.25	ES12	2.00	HV(7)	50(42)kPa						
		2.01	HV(8)	60(48)kPa						
		2.02	HV(9)	55(48)kPa						
								(0.70)		
								2.50	81.84	

PLAN DETAILS



Long Axis Orientation:

10

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Trial pit terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.50m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

AGS

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**SH**	**SH**

Trial Pit Photography Sheet

TP213

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
612827.41

Ground Level (mAOD)
84.34
Northing (OS mN)
136317.89

Start Date
21/08/18
End Date
21/08/18

[TRIAL PIT NUMBER 213: GL- 2.50m]

[TRIAL PIT NUMBER 213: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT / IT

Checked By
SH

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP213

Trial Pit Details

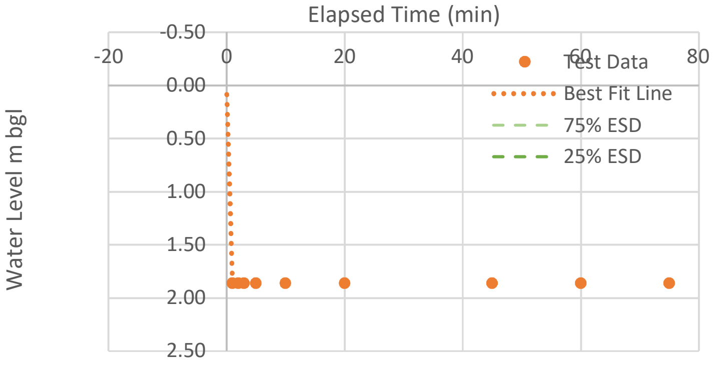
	Test 1	Test 2	Test 3
Depth	2.50		
Width	0.60		
Length	2.10		

Ground Level	84.34	mAOD
Coordinates	612827.41	mE
	136317.89	mN

Date Excavated	21/08/2018
Date Tested	21/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.86	75% esd (mbgl)	2.02
1	1.86	50% esd (mbgl)	2.18
2	1.86	25% esd (mbgl)	2.34
3	1.86	A_{s50} (m^2)	2.99
5	1.86	V_{p75-25} (m^3)	0.40
10	1.86	t_{75} (min)	
20	1.86	t_{25}(min)	
45	1.86	Data Fit R^2	
60	1.86		
75	1.86		

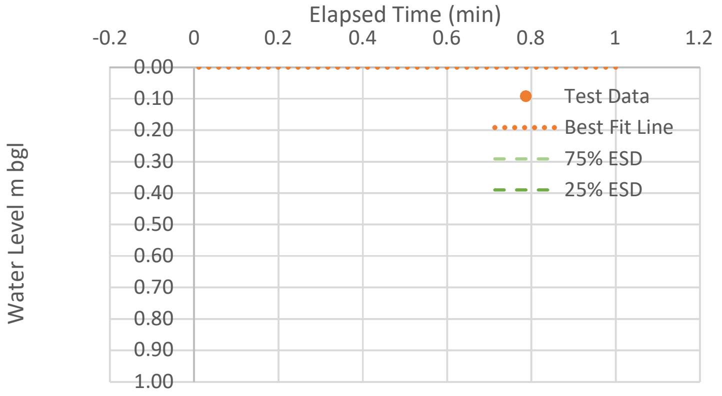


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storage depth (esd) (m) 0.64

Test 2

Time min	Depth to Water m bgl	Test Parameters
		75% esd (mbgl)
		50% esd (mbgl)
		25% esd (mbgl)
		A_{s50} (m^2)
		V_{p75-25} (m^3)
		t_{75} (min)
		t_{25}(min)
		Data Fit R^2

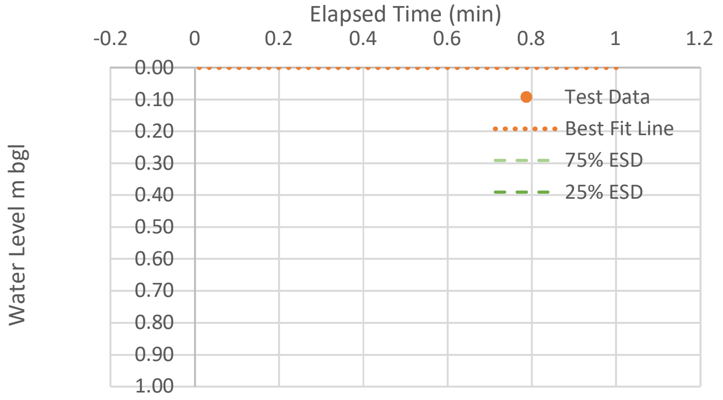


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters
		75% esd (mbgl)
		50% esd (mbgl)
		25% esd (mbgl)
		A_{s50} (m^2)
		V_{p75-25} (m^3)
		t_{75} (min)
		t_{25}(min)
		Data Fit R^2



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test terminated at 1.25 hrs due to lack of soakage.	Logged SH	Checked SH

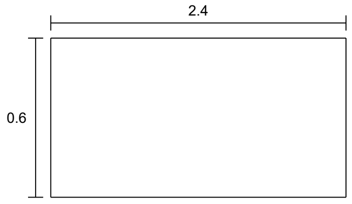
ARCADIS Trial Pit Log

TP214

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**81.68**	**20/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**612876.90**	**136788.62**	**20/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.10	ES1	0.00	PID	<1ppm		Greyish brown silty fine SAND, with occasional 1mm rootlets. [TOPSOIL]		(0.30)		
0.30 - 0.40 0.30 - 0.40	B3 ES2	0.30	PID	<1ppm		MADE GROUND: Very light brown clayey gravelly fine SAND. Gravel is angular to subangular fine to coarse flint. Occasional 100mm pockets of grey mottled orange clayey fine sand. (REWORKED NATURAL)		0.30 (0.30)	81.38	
0.60 - 0.70 0.60 - 0.70	D5 ES4	0.60	PID	<1ppm		Soft light grey mottled orangish brown very sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium flint. [HEAD DEPOSITS]		0.60 (0.60)	81.08	
1.20 - 1.25 1.20 - 1.25	D7 ES6	1.20	PID	<1ppm		Grey mottled orangish brown very silty fine SAND. [FOLKESTONE FORMATION]		1.20 (0.45)	80.48	
1.60 - 1.65 1.60 - 1.65	D9 ES8	1.60	PID	<1ppm						
						Dark grey mottled dark orangish brown clayey fine SAND. [FOLKESTONE FORMATION]		1.65 (0.75)	80.03	
1.80 - 1.90 1.80 - 1.90	D1 ES10	1.80	PID	<1ppm						
								2.40	79.28	

PLAN DETAILS



Long Axis Orientation:

129

Shoring / Support: None
Stability: Stable becoming unstable with addition of water
Groundwater (description):

Remarks

Exploratory hole terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.40m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Trial Pit Photography Sheet

TP214

Project
Otterpool Phase 2

Client
Folkestone and Hythe District Council

Job No
10011914

Easting (OS mE)
612876.90

Ground Level (mAOD)
81.68

Northing (OS mN)
136788.62

Start Date
20/08/18

End Date
20/08/18

[TRIAL PIT NUMBER 214: GL- 2.40m]

[TRIAL PIT NUMBER 214: SPOIL]

Arcadis Cymru House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT / IT

Checked By
SH

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP214

Trial Pit Details

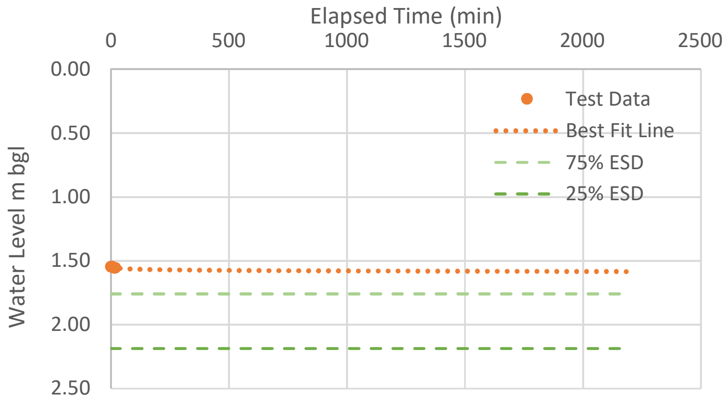
	Test 1	Test 2	Test 3
Depth	2.40		
Width	0.65		
Length	2.40		

Ground Level	81.68	mAOD
Coordinates	612876.9	mE
	136788.62	mN

Date Excavated	20/08/2018
Date Tested	20/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.55	75% esd (mbgl)	1.76
1	1.55	50% esd (mbgl)	1.97
2	1.55	25% esd (mbgl)	2.19
3	1.55	A_{s50} (m^2)	4.17
4	1.55	V_{p75-25} (m^3)	0.67
5	1.55	t_{75} (min)	7.26E+14
10	1.55	t_{25}(min)	5.41E+38
15	1.55	Data Fit R^2	0.774
20	1.55		

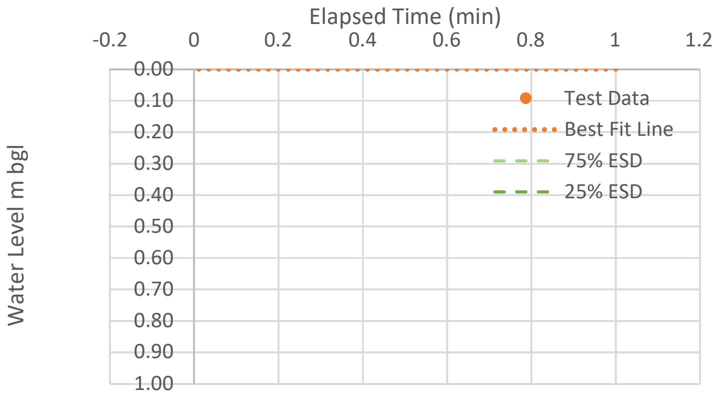


Infiltration rate f (ms^{-1}) **NOT PERMEABLE**

Total effective storage depth (esd) (m) 0.86

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

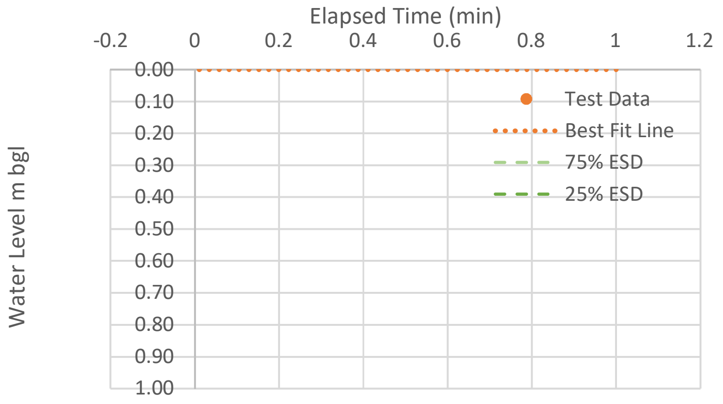


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test terminated due to soil collapse.	Logged IT	Checked SH

ARCADIS Trial Pit Log

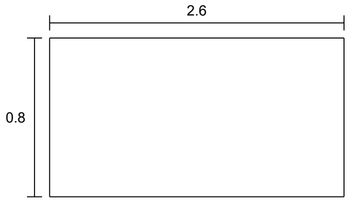
TP215

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **76.88**	Start Date **20/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **612677.96**	Northing (OS mN) **137227.18**	End Date **20/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.20	ES1	0.00	PID	<1ppm	
0.30 - 0.40	B4	0.30	PID	<1ppm	
0.30 - 0.40	D3				
0.30 - 0.40	ES2				
0.70 - 0.75	ES5	0.70	PID	<1ppm	
1.30 - 1.35	B8	1.30	PID	<1ppm	
1.30 - 1.35	D7				
1.30 - 1.35	ES6				
1.65 - 1.70	ES9	1.65	PID	<1ppm	
2.20 - 2.25	B12	2.20	PID	<1ppm	
2.20 - 2.25	D11				
2.20 - 2.25	ES10				

STRATA Description	Depth (Thickness)	Level
Grass over brown silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of flint, pottery and brick. [TOPSOIL]	(0.20) 0.20	76.68
MADE GROUND: Orangish brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to of medium flint.	(0.20) 0.40	76.48
MADE GROUND: Brownish orange silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine flint.	(0.90) 1.30	75.58
Orangish brown very silty fine SAND. [FOLKESTONE FORMATION]	(0.40) 1.70	75.18
Soft grey mottled orange sandy SILT. Sand is fine to coarse. [FOLKESTONE FORMATION]	(0.55) 2.25	74.63
Soft grey mottled orange silty very sandy CLAY. Sand is fine to coarse. [FOLKESTONE FORMATION]	(0.25) 2.50	74.38

PLAN DETAILS



Long Axis Orientation:

94

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Exploratory hole terminated at required depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.50m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Trial Pit Photography Sheet

TP215

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**76.88**	**20/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**612677.96**	**137227.18**	**20/08/18**

[TRIAL PIT NUMBER 215: GL- 2.50m]

[TRIAL PIT NUMBER 215: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

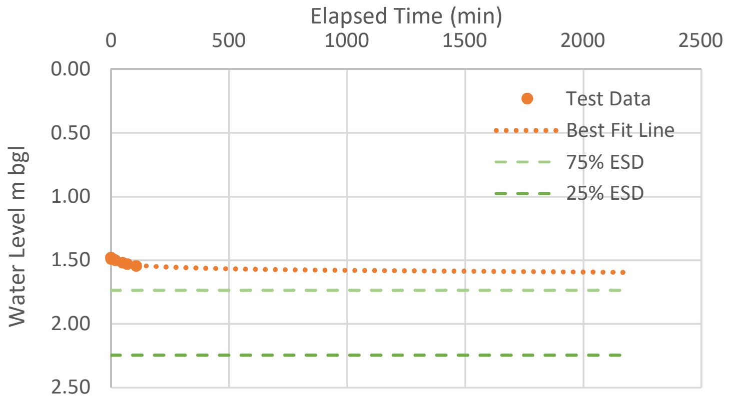
Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP215

Trial Pit Details

	Test 1	Test 2	Test 3						
Depth	2.50			Ground Level	76.88	mAOD	Date Excavated	20/08/2018
Width	0.70			Coordinates	612677.96	mE	Date Tested	20/08/2018
Length	2.05				137227.18	mN		

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.48	75% esd (mbgl)	1.74
1	1.48	50% esd (mbgl)	1.99
2	1.49	25% esd (mbgl)	2.25
3	1.49	A_{s50} (m^2)	4.24
5	1.49	V_{p75-25} (m^3)	0.73
10	1.49	t_{75} (min)	2326798
20	1.50	t_{25}(min)	4.27E+15
50	1.52	Data Fit R^2	0.857
70	1.53		
108	1.55		

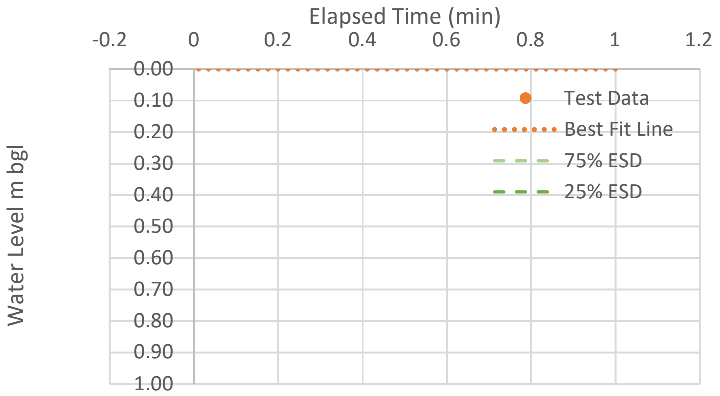


Infiltration rate f (ms^{-1}) **NOT PERMEABLE**

Total effective storage depth (esd) (m) 1.02

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

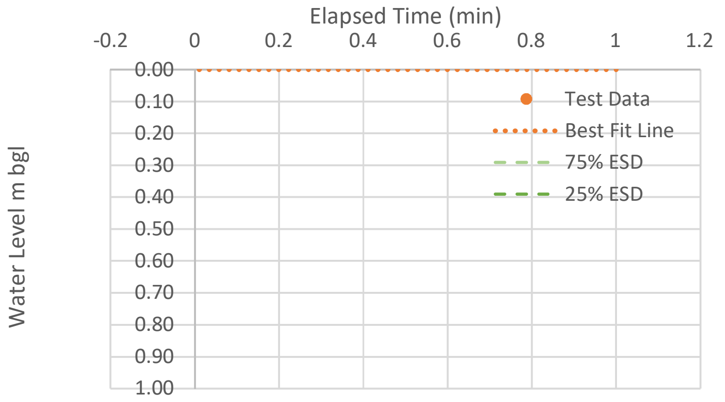


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes:	Logged IT	Checked SH

ARCADIS Trial Pit Log

TP217

Project **Otterpool Phase 2**	Project No. **10011914**	Ground Level (mAOD) **65.33**	Start Date **15/08/2018**	Scale **1:25**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611230.81**	Northing (OS mN) **137524.27**	End Date **15/08/2018**	**Sheet 1 of 1**

SAMPLES

Depth	Type/ No.
0.00 - 0.36	D2
0.00 - 0.36	ES1
0.36 - 0.52	B5
0.36 - 0.52	D4
0.36 - 0.52	ES3
1.00 - 1.10	D11
1.00 - 1.10	ES6
1.50 - 1.60	B9
1.50 - 1.60	D8
1.50 - 1.60	ES7
1.70 - 1.90	ES10

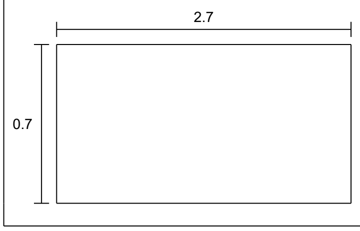
TESTS

Depth	Type/ No.	Results
0.36	PID	<1ppm
0.36	PID	<1ppm
0.52	PID	<1ppm
0.52	PID	<1ppm
0.52	PID	<1ppm
1.10	PID	<1ppm
1.10	PID	<1ppm
1.50	HV(1)	35(20)kPa
1.50	HV(2)	44(20)kPa
1.60	PID	<1ppm
1.60	PID	<1ppm
1.60	PID	<1ppm
1.70	HV(3)	30(28)kPa
1.70	HV(4)	56(28)kPa
1.70	HV(5)	56(28)kPa
1.90	PID	<1ppm

STRATA

Description	Depth (Thickness)	Level
Grass over brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse flint. [TOPSOIL]	(0.36) 0.36	64.97
Orangish brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to medium flint (Re-worked). [HEAD DEPOSITS] Fragments of infilled clay pipe encountered.	(1.14) 1.50	63.83
Soft to firm grey mottled reddish brown slightly silty sandy CLAY. Sand is fine to medium. [HEAD DEPOSITS]	(1.10) 2.60	62.73

PLAN DETAILS



Long Axis Orientation: 100

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth: 2.60m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Trial Pit Photography Sheet

TP217

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No	Ground Level (mAOD)	Start Date
10011914	**65.33**	**15/08/18**
Easting (OS mE)	Northing (OS mN)	End Date
611230.81	**137524.27**	**15/08/18**

[TRIAL PIT NUMBER 217: GL- 2.60m]

[TRIAL PIT NUMBER 217: SPOIL]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP217

Trial Pit Details

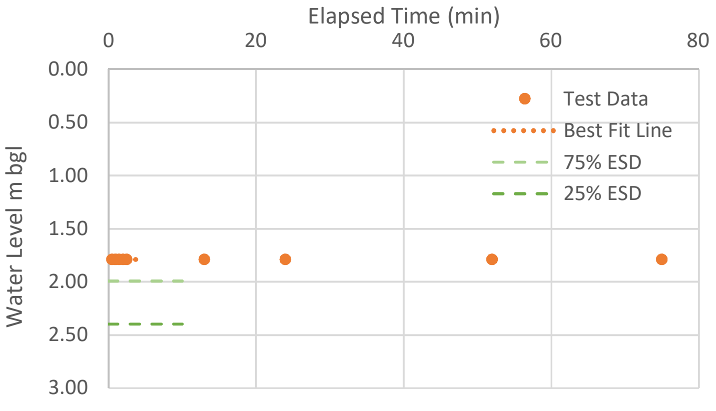
	Test 1	Test 2	Test 3
Depth	2.60		
Width	0.70		
Length	2.70		

Ground Level	65.33	mAOD
Coordinates	611230.81	mE
	137524.27	mN

Date Excavated	15/08/2018
Date Tested	15/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.79	75% esd (mbgl)	1.99
0.5	1.79	50% esd (mbgl)	2.20
1	1.79	25% esd (mbgl)	2.40
1.5	1.79	A_{s50} (m^2)	4.64
2	1.79	V_{p75-25} (m^3)	0.77
2.5	1.79	t_{75} (min)	
13	1.79	t_{25}(min)	
24	1.79	Data Fit R^2	
52	1.79		
75	1.79		

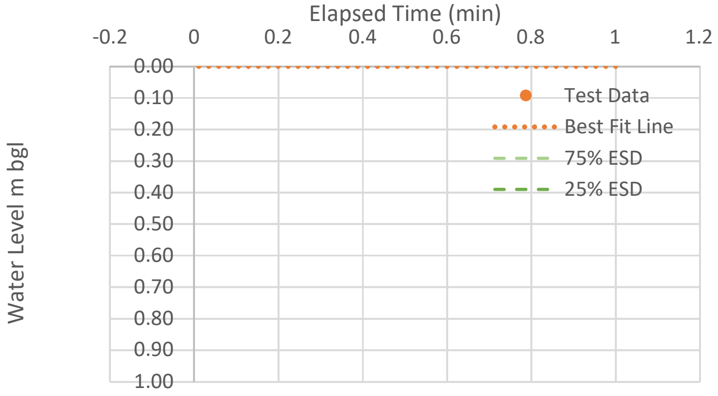


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storage depth (esd) (m) 0.81

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

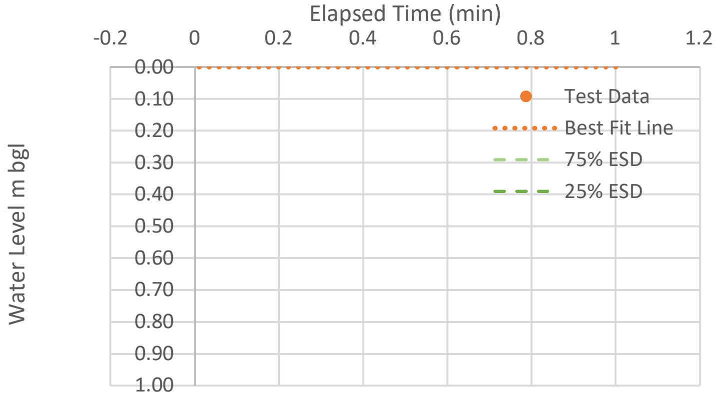


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m) 0.00

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test terminated after 75 min due to lack of soakage.	Logged IT	Checked SH

ARCADIS Trial Pit Log

TP218

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Project No.
10011914
Easting (OS mE)
609909.78

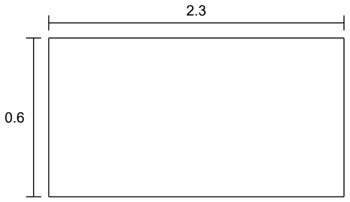
Ground Level (mAOD)
58.59
Northing (OS mN)
137648.02

Start Date
16/08/2018
End Date
16/08/2018

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.12	ES1	0.00	PID	<1ppm		Grass over greyish brown clayey fine to medium SAND with occasional rootlets and vegetation. [TOPSOIL]		(0.30) 0.30	58.29	
0.40 - 0.50 0.40 - 0.50 0.40 - 0.50	B11 D7 ES2	0.40	PID	<1ppm		Very soft yellowish brown slightly sandy CLAY with occasional rootlets and rare charcoal. Sand is fine. [HEAD DEPOSITS]		(0.60) 0.90	57.69	
0.90 - 1.00 0.90 - 1.00 0.90 - 1.34	D8 ES3 B12	0.90	PID	<1ppm		Grey mottled orangish brown silty becoming clayey fine SAND. [HEAD DEPOSITS]		(0.44) 1.34	57.25	
1.34 - 1.50 1.34 - 1.50 1.34 - 1.80	D9 ES4 B13	1.34	PID	<1ppm		Very soft brownish grey mottled orangish brown sandy CLAY. Sand is fine to coarse [ATHERFIELD CLAY FORMATION]		(1.36) 2.70	55.89	
2.00 - 2.10 2.00 - 2.10	D10 ES5	2.00	PID	<1ppm						
		2.50	PID	<1ppm						
2.60 - 2.70	ES6									

PLAN DETAILS



Long Axis Orientation:
90

Shoring / Support: None

Stability: Collapse on face A

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:
2.70m

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Contractor
Arcadis Consulting (UK) Ltd

Logged By
IT

Checked By
SH

Trial Pit Photography Sheet

TP218

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**58.59**	**16/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**609909.78**	**137648.02**	**16/08/18**

[TRIAL PIT NUMBER 218: GL- 2.70m]

[TRIAL PIT NUMBER 218: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP218

Trial Pit Details

	Test 1	Test 2	Test 3
Depth	2.70		
Width	0.60		
Length	2.30		

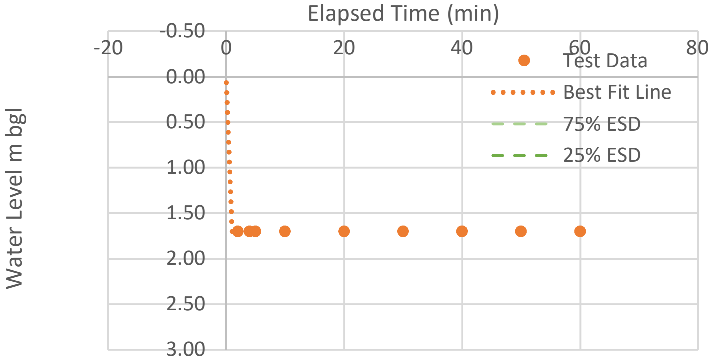
Ground Level	58.59	mAOD
Coordinates	609909.78	mE
	137648.02	mN

Date Excavated	16/08/2018
Date Tested	16/08/2018

Test 1

Time min	Depth to Water m bgl
1	1.70
2	1.70
4	1.70
5	1.70
10	1.70
20	1.70
30	1.70
40	1.70
50	1.70
60	1.70

Test Parameters	
75% esd (mbgl)	1.95
50% esd (mbgl)	2.20
25% esd (mbgl)	2.45
A_{s50} (m^2)	4.28
V_{p75-25} (m^3)	0.69
t_{75} (min)	
t_{25}(min)	
Data Fit R^2	



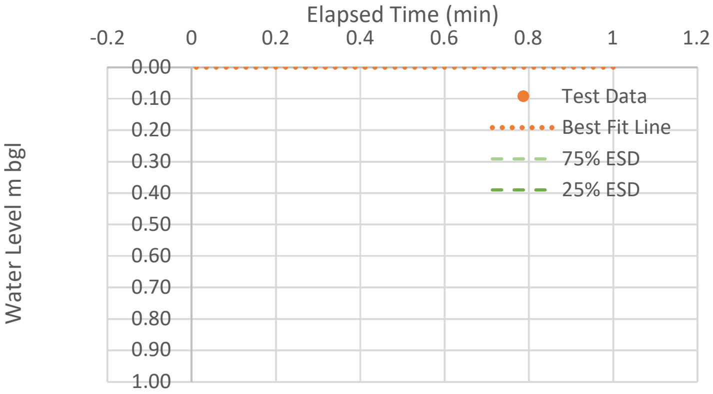
Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storage depth (esd) (m) 1.00

Test 2

Time min	Depth to Water m bgl

Test Parameters	
75% esd (mbgl)	
50% esd (mbgl)	
25% esd (mbgl)	
A_{s50} (m^2)	
V_{p75-25} (m^3)	
t_{75} (min)	
t_{25}(min)	
Data Fit R^2	



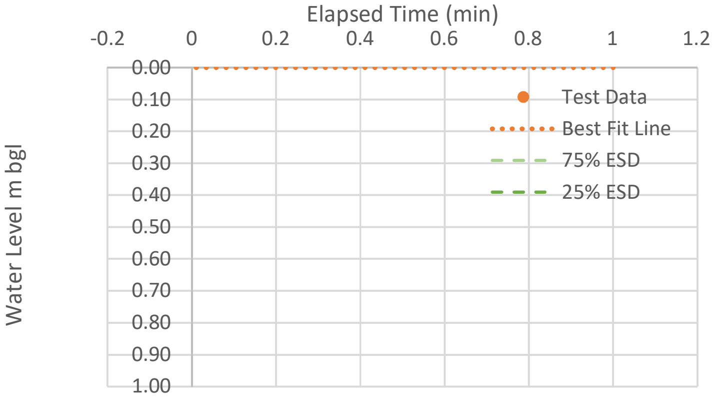
Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl

Test Parameters	
75% esd (mbgl)	
50% esd (mbgl)	
25% esd (mbgl)	
A_{s50} (m^2)	
V_{p75-25} (m^3)	
t_{75} (min)	
t_{25}(min)	
Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test terminated after 60 min due to lack of soakage.	Logged IT	Checked SH

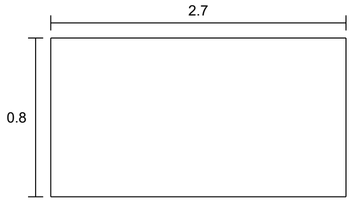
ARCADIS Trial Pit Log

TP219

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**58.37**	**16/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**610035.81**	**137518.77**	**16/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
						Dark brownish grey clayey fine to medium SAND with occasional rootlets. [TOPSOIL]		(0.35) 0.35	58.02	
						MADE GROUND: Orangish brown slightly gravelly silty fine to medium SAND. Gravel is angular to subrounded fine brick and concrete with rare shells.		(0.30) 0.65	57.72	

PLAN DETAILS



Long Axis Orientation: 20

Shoring / Support: None

Stability:

Groundwater (description):

Remarks

Terminated due to metal pipe found at a depth of 0.65 mbgl. CAT picked signal on power and radio mode.

Termination Depth: 0.65m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP219

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**58.37**	**16/08/18**
Client	**Easting (OS mE)**	**Northing (OS mN)**	**End Date**
Folkestone and Hythe District Council	**610035.81**	**137518.77**	**16/08/18**

[TRIAL PIT NUMBER 219: GL- 0.65m]

[TRIAL PIT NUMBER 219: METAL PIPE]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

ARCADIS Trial Pit Log

TP219A

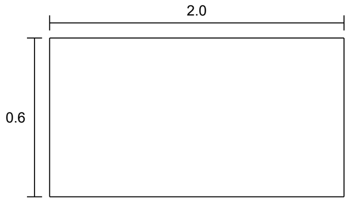
Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**58.37**	**16/08/2018**	**1:25**

Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**610035.81**	**137518.77**	**16/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.30 0.00 - 0.30	D2 ES1	0.00	PID	<1ppm	
0.54 - 0.64 0.54 - 0.64 0.54 - 0.64	B5 D4 ES3	0.54	PID	<1ppm	
0.90 - 1.00 0.90 - 1.00 0.90 - 1.00	B8 D7 ES6	0.90	PID	<1ppm	
1.40 - 1.50 1.40 - 1.50 1.40 - 1.50	B11 D10 ES9	1.40	PID	<1ppm	

STRATA Description	Depth (Thickness)	Level
Grass over brown slightly gravelly clayey fine to coarse SAND with occasional roots and rootlets. Gravel is subangular to subrounded fine flint and brick. [TOPSOIL]	(0.30) 0.30	58.06
MADE GROUND: Orangish brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse limestone (Reworked).	(0.60) 0.90	57.46
Orangish brown and yellowish brown mottled brown silty fine to coarse SAND with occasional 1cm charcoal pockets towards the base. [HEAD DEPOSITS]	(0.60) 1.50	56.86
Weak grey mottled orange fine grained SANDSTONE. [HYTHE FORMATION]	(0.10) 1.60	56.76

PLAN DETAILS



Long Axis Orientation:

20

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

TP219A is located 5m west of its original location (TP219). Terminated on bedrock. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

1.60m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Trial Pit Photography Sheet

TP219A

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**58.37**	**16/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**610035.81**	**137518.77**	**16/08/18**

[TRIAL PIT NUMBER 219A: GL- 1.60m]

[TRIAL PIT NUMBER 219A: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

ARCADIS Design & Consultancy for natural and built assets

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP219A

Trial Pit Details

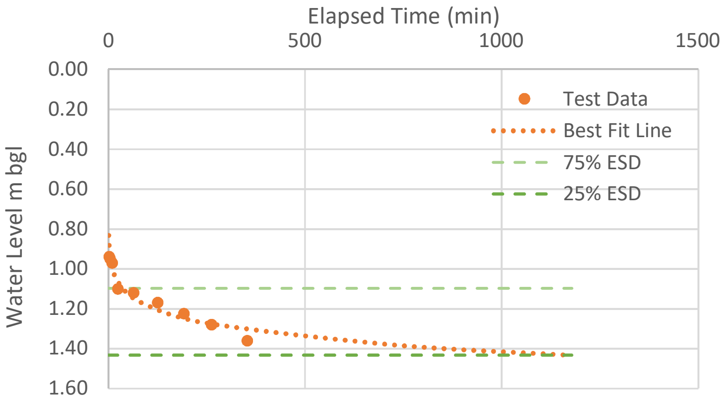
	Test 1	Test 2	Test 3
Depth	1.60		
Width	0.65		
Length	2.00		

Ground Level	58.37	mAOD
Coordinates	610035.81	mE
	137518.77	mN

Date Excavated	16/08/2018
Date Tested	16/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
1	0.93	75% esd (mbgl)	1.10
3	0.94	50% esd (mbgl)	1.27
5	0.95	25% esd (mbgl)	1.43
10	0.97	A_{s50} (m^2)	3.08
25	1.10	V_{p75-25} (m^3)	0.44
65	1.12	t_{75} (min)	36.52951
126	1.17	t_{25}(min)	1167.766
193	1.23	Data Fit R^2	0.957
263	1.28		
354	1.36		

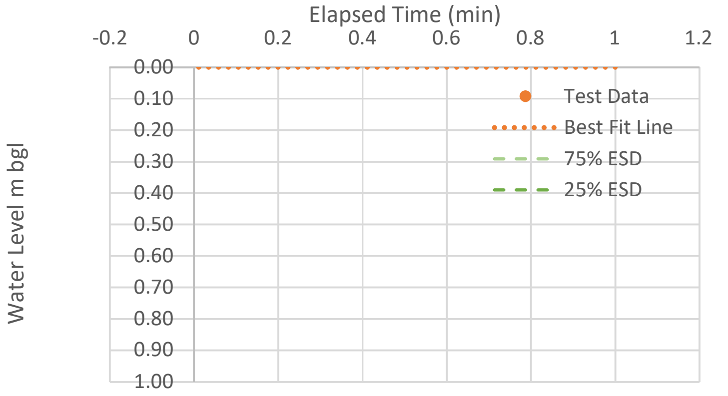


Infiltration rate f (ms^{-1}) **2.09E-06**

Total effective storage depth (esd) (m) 0.67

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

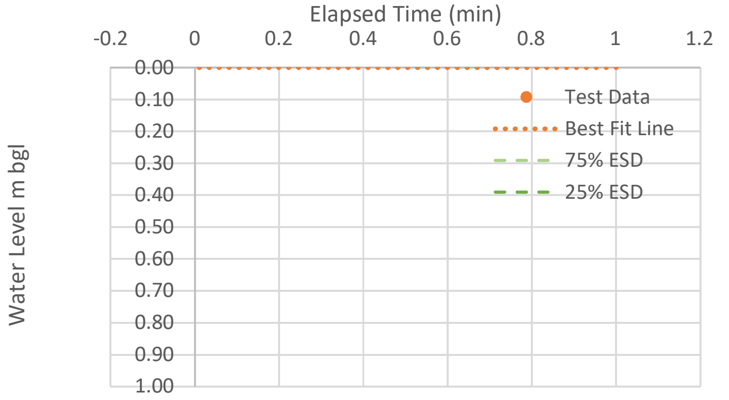


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by	Notes:	Logged	Checked
Arcadis Consulting (UK) Ltd		IT	SH

ARCADIS Trial Pit Log

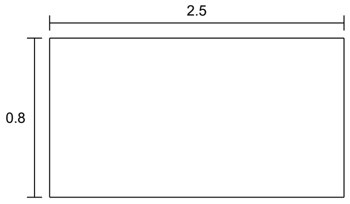
TP220

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**64.02**	**17/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**609640.00**	**137267.45**	**17/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.10	ES1	0.00	PID	<1ppm	
0.22 - 0.30 0.22 - 0.30 0.22 - 0.30	B4 D3 ES2	0.22	PID	<1ppm	
0.70 - 0.76	ES5	0.70	PID	<1ppm	
1.00 - 1.10 1.00 - 1.10	D7 ES6	1.00	PID	<1ppm	
1.40 - 1.45	ES8	1.40 1.40	PID HV(1)	<1ppm 30(10)kPa	
1.80 - 1.90 1.80 - 1.90	D10 ES9	1.80 1.80	PID HV(2)	<1ppm 44(20)kPa	
2.40 - 2.50	ES11	2.40	PID	<1ppm	
		2.50	HV(3)	50(20)kPa	

STRATA		Depth (Thickness)	Level	Install/ Backfill
Description	Legend			
Grass over brown slightly gravelly silty fine to coarse SAND with frequent pockets of clay (2cm). Gravel is subrounded fine flint. [TOPSOIL]		(0.22) 0.22	63.80	
Soft grey brown mottled orangish brown sandy CLAY. Sand is fine to coarse. [ATHERFIELD CLAY FORMATION]		(0.18) 0.40	63.62	
Soft light brown mottled orangish brown sandy CLAY. Sand is fine to coarse. [ATHERFIELD CLAY FORMATION]		(1.00) 1.40	62.62	
Soft to firm becoming stiff grey brown CLAY. [ATHERFIELD CLAY FORMATION]		(1.00) 2.40	61.62	
Soft to firm grey brown slightly silty gravelly CLAY. Gravel is subangular to subrounded fine to coarse limestone [ATHERFIELD CLAY FORMATION]		(0.10) 2.50	61.52	

PLAN DETAILS



Long Axis Orientation:

45

Shoring / Support: None

Stability: Good

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.50m

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Trial Pit Photography Sheet

TP220

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**type**	**17/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**609640.00**	**137267.45**	**17/08/18**

[TRIAL PIT NUMBER 220: GL- 2.50m]

[TRIAL PIT NUMBER 220: SPOIL]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

ARCADIS Design & Consultancy for natural and built assets

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP220

Trial Pit Details

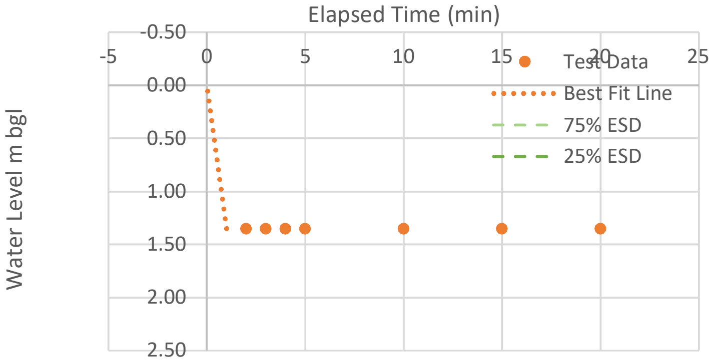
	Test 1	Test 2	Test 3
Depth	2.50		
Width	2.50		
Length	0.80		

Ground Level	64.02	mAOD
Coordinates	609640	mE
	137267.45	mN

Date Excavated	17/08/2018
Date Tested	17/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
1	1.35	75% esd (mbgl)	1.64
2	1.35	50% esd (mbgl)	1.93
3	1.35	25% esd (mbgl)	2.21
4	1.35	A_{s50} (m^2)	5.80
5	1.35	V_{p75-25} (m^3)	1.15
10	1.35	t_{75} (min)	
15	1.35	t_{25}(min)	
20	1.35	Data Fit R^2	

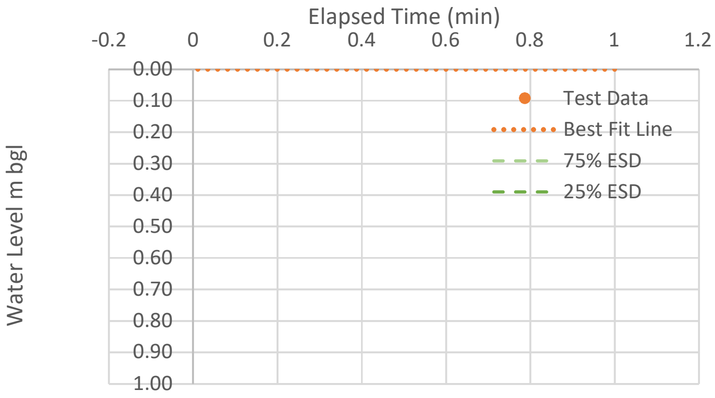


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storage depth (esd) (m) 1.15

Test 2

Time min	Depth to Water m bgl	Test Parameters
		75% esd (mbgl)
		50% esd (mbgl)
		25% esd (mbgl)
		A_{s50} (m^2)
		V_{p75-25} (m^3)
		t_{75} (min)
		t_{25}(min)
		Data Fit R^2

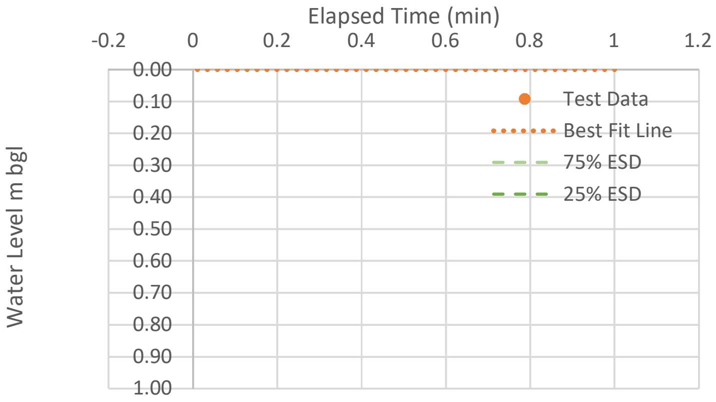


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters
		75% esd (mbgl)
		50% esd (mbgl)
		25% esd (mbgl)
		A_{s50} (m^2)
		V_{p75-25} (m^3)
		t_{75} (min)
		t_{25}(min)
		Data Fit R^2



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by	Notes: Test terminated after 20 min due to lack of soakage.	Logged	Checked
Arcadis Consulting (UK) Ltd		IT	SH

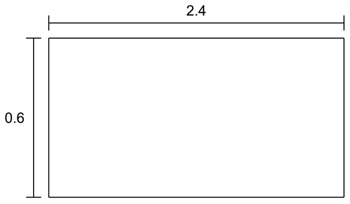
ARCADIS Trial Pit Log

TP221

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**88.16**	**21/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**610541.97**	**136217.05**	**21/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.10 - 0.30 0.10 - 0.30	B1 ES2	0.10	PID	<1ppm		Crop over soft dark brown slightly sandy slightly gravelly organic CLAY. Sand is fine to medium. Gravel is subangular to rounded medium coarse of flint. [TOPSOIL]		(0.30)		
0.30 - 0.50 0.30 - 0.50	B3 ES4	0.30	PID	<1ppm		Soft to firm brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to rounded medium coarse flint. [HEAD DEPOSITS]		0.30 (0.40)	87.86	
0.70 - 1.00 0.70 - 1.00	B5 ES6	0.70	PID	<1ppm		Firm to stiff dark brown mottled brown slightly sandy CLAY. Sand is fine to coarse. [HYTHE FORMATION]		0.70 (0.30)	87.46	
1.10 - 1.30 1.10 - 1.30	B7 ES8	1.10	PID	<1ppm		Firm light grey laminated light brown sandy CLAY with low cobble content. Sand is fine to medium. Cobbles are angular to subangular of weak light grey limestone. [HYTHE FORMATION]		1.00 (0.45)	87.16	
1.45 - 1.50	B9					Weak light grey LIMESTONE. [HYTHE FORMATION]		1.45 1.50	86.71 86.66	

PLAN DETAILS



Long Axis Orientation:

43

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Trial pit terminated on bedrock. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

1.50m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**SH**	**SH**

Trial Pit Photography Sheet

TP221

Project **Otterpool Phase 2**	Job No **10011914**	Ground Level (mAOD) **88.16**	Start Date **21/08/18**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **610541.97**	Northing (OS mN) **136217.05**	End Date **21/08/18**

[TRIAL PIT NUMBER 221: GL- 1.50m]

[TRIAL PIT NUMBER 221: SPOIL]

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used **JCB 3CX**	Logged By **MT / IT**	Checked By **SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP221

Trial Pit Details

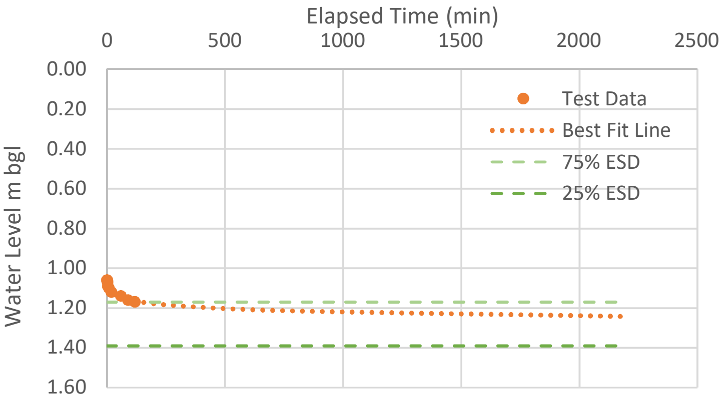
	Test 1	Test 2	Test 3
Depth	1.50		
Width	0.60		
Length	2.40		

Ground Level	88.16	mAOD
Coordinates	610541.97	mE
	136217.05	mN

Date Excavated	21/08/2018
Date Tested	21/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.06	75% esd (mbgl)	1.17
1	1.06	50% esd (mbgl)	1.28
2	1.06	25% esd (mbgl)	1.39
3	1.07	A_{s50} (m^2)	2.76
5	1.09	V_{p75-25} (m^3)	0.32
10	1.10	t_{75} (min)	144.3587
20	1.12	t_{25}(min)	353361
60	1.14	Data Fit R^2	0.980
90	1.16		
120	1.17		

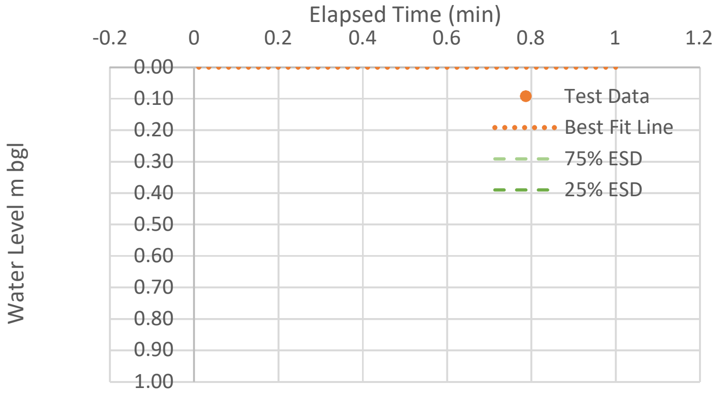


Infiltration rate f (ms^{-1}) **5.42E-09**

Total effective storage depth (esd) (m) 0.44

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

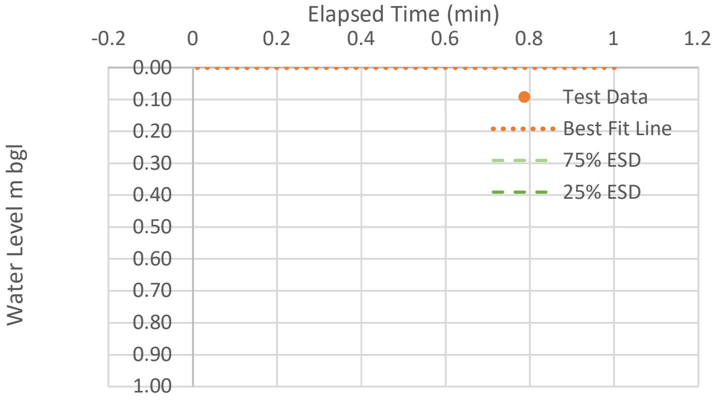


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test terminated after 2 hours.	Logged SH	Checked SH

ARCADIS Trial Pit Log

TP222

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Project No.
10011914
Easting (OS mE)
610477.51

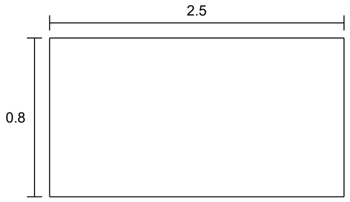
Ground Level (mAOD)
85.93
Northing (OS mN)
136008.61

Start Date
22/08/2018
End Date
22/08/2018

Scale
1:25
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.10	ES1	0.00	PID	<1ppm		Grass over brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse flint. [TOPSOIL]		(0.40) 0.40	85.53	
0.50 - 0.60 0.50 - 0.60 0.50 - 0.60	B4 D3 ES2	0.50	PID	<1ppm		MADE GROUND: Soft light brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse limestone.		(0.20) 0.60	85.33	
0.75 - 0.80 0.75 - 0.80	D6 ES5	0.75	PID	<1ppm		Light grey limestone recovered as light grey clayey sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse limestone. Cobble is subangular. [HYTHE FORMATION]		(0.50) 1.10	84.83	
1.10 - 1.20 1.10 - 1.20	B7 ES8	1.10	PID	<1ppm		Light grey limestone recovered as firm light grey silty gravelly CLAY with medium cobble content. Gravel is subangular to subrounded fine to coarse limestone. Cobble is subangular. [HYTHE FORMATION]		(0.50) 1.60	84.33	
1.60 - 1.65	ES9	1.60	PID	<1ppm		Weak light grey LIMESTONE. [HYTHE FORMATION]		1.65	84.28	

PLAN DETAILS



Long Axis Orientation:

180

Shoring / Support: None

Stability: Poor

Groundwater (description):

Remarks

Slight seepage encountered at 1.62mbgl on rock surface. Trial pit terminated at 1.65m due to encountering bedrock at 1.60m. Permeability test undertaken.

Termination Depth:
1.65m

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Trial Pit Photography Sheet

TP222

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**85.93**	**22/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**610477.51**	**136008.61**	**22/08/18**

[TRIAL PIT NUMBER 222: GL- 1.65m]

[TRIAL PIT NUMBER 222: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP222

Trial Pit Details

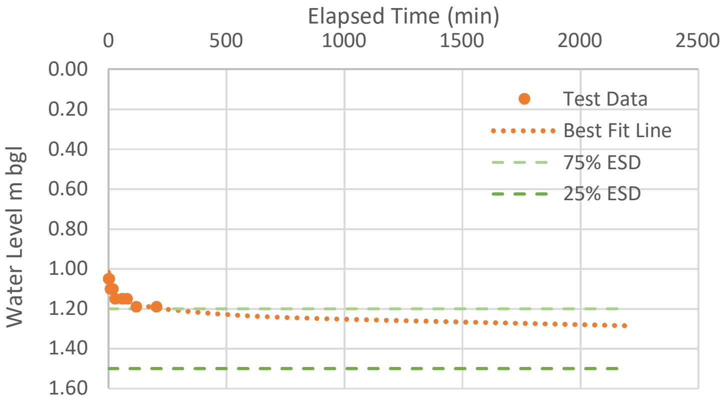
	Test 1	Test 2	Test 3
Depth	1.65		
Width	0.80		
Length	2.54		

Ground Level	85.93	mAOD
Coordinates	610477.51	mE
	136008.61	mN

Date Excavated	22/08/2018
Date Tested	22/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
1	1.05	75% esd (mbgl)	1.20
2	1.05	50% esd (mbgl)	1.35
5	1.05	25% esd (mbgl)	1.50
10	1.10	A_{s50} (m^2)	4.04
20	1.10	V_{p75-25} (m^3)	0.61
30	1.15	t_{75} (min)	230.1932
60	1.15	t_{25}(min)	367630.4
80	1.15	Data Fit R^2	0.930
120	1.19		
205	1.19		

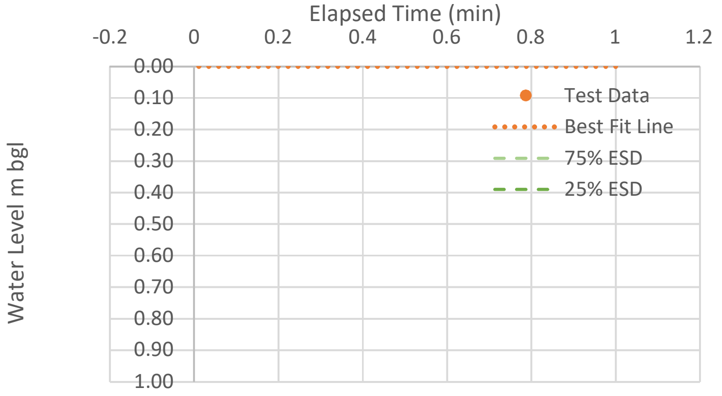


Infiltration rate f (ms^{-1}) **6.85E-09**

Total effective storage depth (esd) (m) 0.60

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

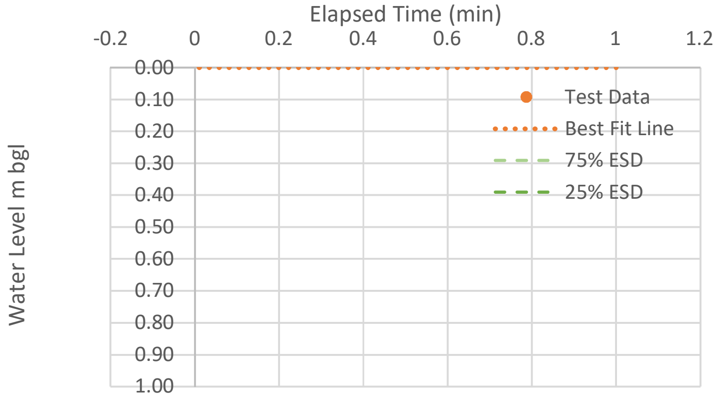


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes:	Logged IT	Checked SH

ARCADIS Trial Pit Log

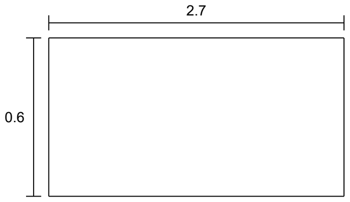
TP223

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**105.61**	**29/08/2018**	**1:25**
Client	**Easting (OS mE)**	**Northing (OS mN)**	**End Date**	
Folkestone and Hythe District Council	**611503.02**	**135354.74**	**29/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.20	ES1				
		0.15	PID	<1ppm	
0.20 - 0.25	B2				
0.20 - 0.25	ES3	0.25	PID	<1ppm	
0.60 - 0.70	B4	0.60	PID	<1ppm	
0.60 - 0.70	ES5				
1.30 - 1.40	B6	1.30	PID	<1ppm	
1.30 - 1.40	ES7				
1.60 - 1.70	B8	1.60	PID	<1ppm	
1.60 - 1.70	ES9				
2.20 - 2.30	B10				

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Grass on top brownish grey slightly gravelly clayey fine SAND, with frequent 1mm rootlets. Gravel is subangular to subrounded fine to coarse flint. [TOPSOIL]		(0.20) 0.20	105.41	
Orangish brown sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS] Rare decayed vegetation.		(2.40) 2.60	103.01	

PLAN DETAILS



Long Axis Orientation:

140

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered. Permeability test undertaken.

Termination Depth:

2.60m

AGS Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm),
Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP223

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**105.61**	**29/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611503.02**	**135354.74**	**29/08/18**

[TRIAL PIT NUMBER 223: GL- 2.60m]

[TRIAL PIT NUMBER 223: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Trial Pit Soakaway Test

Based on BRE DG 365:2016

Project	Otterpool - Phase 2	Status	LOCATION ID
Project ID	10011914	CHECKED	TP223

Trial Pit Details

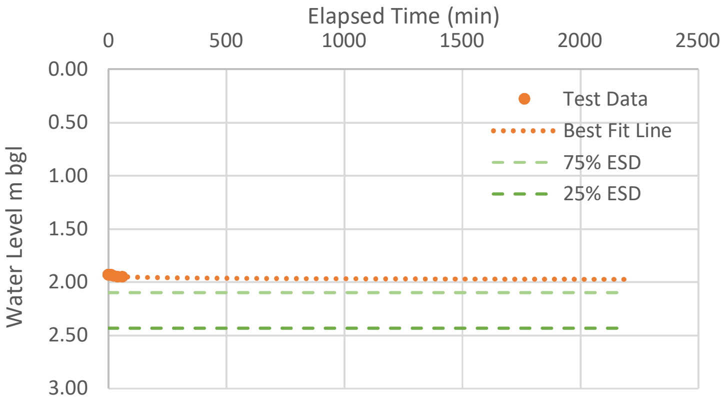
	Test 1	Test 2	Test 3
Depth	2.60		
Width	2.70		
Length	0.60		

Ground Level	105.61	mAOD
Coordinates	611503.02	mE
	135354.74	mN

Date Excavated	29/08/2018
Date Tested	29/08/2018

Test 1

Time min	Depth to Water m bgl	Test Parameters	
0	1.93	75% esd (mbgl)	2.10
0.5	1.93	50% esd (mbgl)	2.27
1	1.93	25% esd (mbgl)	2.43
1.5	1.93	A_{s50} (m^2)	3.83
2	1.93	V_{p75-25} (m^3)	0.54
6	1.93	t_{75} (min)	6.93E+10
12	1.93	t_{25}(min)	1.1E+29
22	1.94	Data Fit R^2	0.685
40	1.95		
60	1.95		

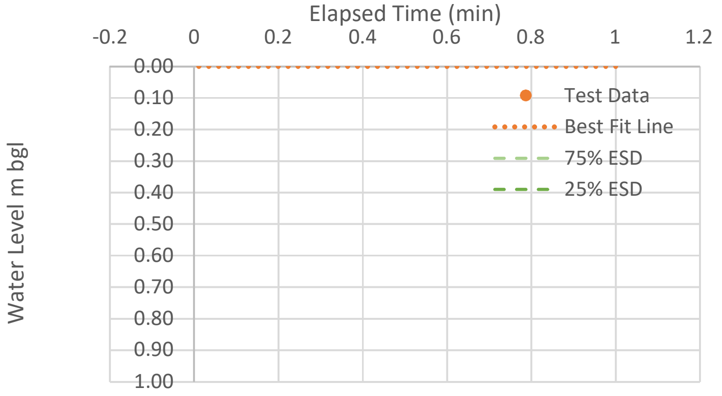


Infiltration rate f (ms^{-1}) **NOT PERMEABLE**

Total effective storage depth (esd) (m) 0.67

Test 2

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	

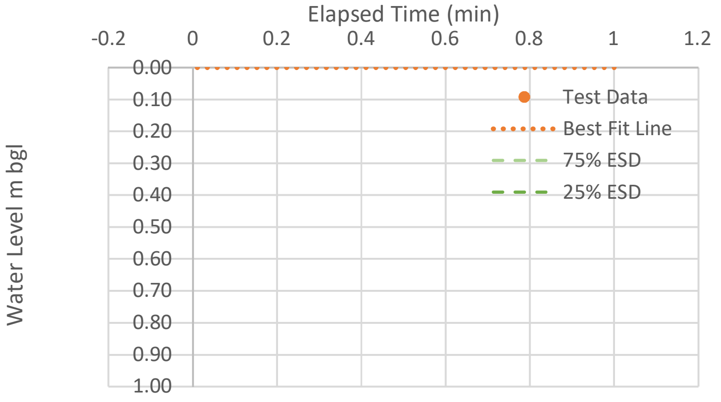


Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Test 3

Time min	Depth to Water m bgl	Test Parameters	
		75% esd (mbgl)	
		50% esd (mbgl)	
		25% esd (mbgl)	
		A_{s50} (m^2)	
		V_{p75-25} (m^3)	
		t_{75} (min)	
		t_{25}(min)	
		Data Fit R^2	



Infiltration rate f (ms^{-1}) **NO VALID DATA**

Total effective storeage depth (esd) (m)

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test terminated after 60 min due to lack of soakage.	Logged IT	Checked SH

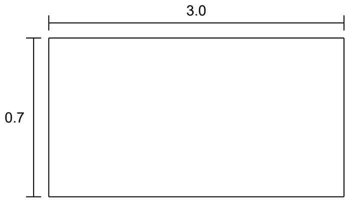
ARCADIS Trial Pit Log

TP226

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**96.90**	**29/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611515.55**	**135949.40**	**29/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend	Depth (Thickness)	Level	Install/ Backfill
0.00 - 0.15	ES1					Grass over grey slightly gravelly clayey fine to medium SAND, with frequent 1mm rootlets. Gravel is subangular to subrounded fine to medium of flint. [TOPSOIL]		(0.15) 0.15	96.75	
0.15 - 0.25	B2	0.15	PID	<1ppm		Soft to firm orangish brown sandy gravelly CLAY. Gravel is angular fine to coarse sandstone. [HEAD DEPOSITS]		(0.23) 0.38	96.52	
0.15 - 0.25	ES3	0.25	PID	<1ppm						
						Weak light grey LIMESTONE. [HYTHE FORMATION]		0.40	96.50	

PLAN DETAILS



Long Axis Orientation:

100

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Trial pit refused and terminated on bedrock at 0.40m bgl. No soakaway test undertaken due to shallow depth of hole. Groundwater not encountered.

Termination Depth:

0.40m

AGS
Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP226

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**96.90**	**29/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611515.55**	**135949.90**	**29/08/18**

[TRIAL PIT NUMBER 226: GL- 0.4m]

[TRIAL PIT NUMBER 226: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT

Checked By
SH

ARCADIS Trial Pit Log

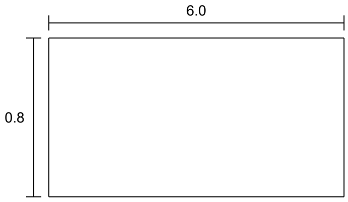
TP227

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**103.80**	**31/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611629.31**	**135451.68**	**31/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.10	ES1	0.00	PID	<1ppm	
0.20 - 0.30	B2	0.20	PID	<1ppm	
0.20 - 0.30	ES3				
2.00 - 2.20	B4	2.00	PID	<1ppm	
2.00 - 2.20	ES5				

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Grass over soft grey brown slightly gravelly sandy CLAY with frequent roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium chalk. [TOPSOIL]		(0.20) 0.20	103.60	
Very stiff light brown mottled orangish brown slightly gravelly sandy CLAY with low/medium cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse sandstone. Cobbles are subangular to subrounded of sandstone. [HEAD DEPOSITS]		(2.10) 2.30	101.50	

PLAN DETAILS



Long Axis Orientation:

106

Shoring / Support: None

Stability: Good

Groundwater (description):

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:

2.30m

AGS

Arcadis Cymru House
St Mellons Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP227

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**103.80**	**31/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611629.31**	**135451.68**	**31/08/18**

[TRIAL PIT NUMBER 227: GL- 2.30m]

[TRIAL PIT NUMBER 227: SPOIL]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

ARCADIS Trial Pit Log

TP228

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**100.16**	**29/08/2018**	**1:25**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611420.91**	**135791.53**	**29/08/2018**	**Sheet 1 of 1**

SAMPLES

Depth	Type/ No.
0.00 - 0.20	ES1
0.20 - 0.40	B2
0.20 - 0.40	ES3
0.50 - 0.70	B4
0.50 - 0.70	ES5
0.90	B6
0.90	ES7
1.00 - 1.10	B8
1.00 - 1.10	ES9
1.15 - 1.30	B10

TESTS

Depth	Type/ No.	Results
0.20	PID	<1ppm
0.40	PID	<1ppm
0.70	PID	<1ppm
0.90	PID	<1ppm
1.10	PID	<1ppm
1.30	PID	<1ppm

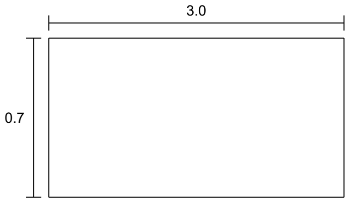
Water Strikes

STRATA

Description	Legend	Depth (Thickness)	Level
Soft to firm grass on top brownish grey and orange sandy CLAY, with frequent 1mm rootlets. Sand is fine to coarse. [TOPSOIL]	▨	(0.20) 0.20	99.96
MADE GROUND: Multi coloured gravelly silty fine to coarse SAND, with low cobble content. Cobbles are subangular to subrounded sandstone. Gravel is subangular to subrounded fine to coarse of weathered sandstone and flint. Rare charcoal.	▨	(0.30) 0.50	99.66
MADE GROUND: Recovered as light grey and reddish orange sandy gravelly COBBLES, with medium boulder content. Boulders are angular to subangular brick and concrete. Cobbles are angular to subangular brick. Gravel is angular to subangular of brick and concrete. Sand is fine to coarse.	▨	(0.15) 0.65	99.51
Stiff to very stiff light orangish brown mottled orangish brown and dark brown silty sandy CLAY. [HEAD DEPOSITS]	▨	(0.35) 1.00	99.16
Stiff to very stiff dark grey and dark orangish brown sandy gravelly CLAY, with frequent 1mm rootlets and bioturbation. Gravel is subangular to subrounded of ironstone and flint. Sand is fine to coarse. (Possible Relic Topsoil). [HEAD DEPOSITS]	▨	(0.15) 1.15	99.01
Weathered SANDSTONE recovered as slightly silty sandy GRAVEL, with high cobble content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse sandstone. Cobbles are angular to subangular sandstone. [HYTHE FORMATION]	▨	(0.55) 1.70	98.46

Install/ Backfill

PLAN DETAILS



Long Axis Orientation:

40

Shoring / Support: None

Stability: Stable

Groundwater (description):

Remarks

Trial pit refused and terminated on bedrock at 1.70m bgl. Groundwater not encountered.

Termination Depth:

1.70m

Arcadis Cymru House
St Mellons
Business Park
Cardiff, CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
JCB 3CX	**Arcadis Consulting (UK) Ltd**	**MT**	**SH**

Trial Pit Photography Sheet

TP228

Project	Job No	Ground Level (mAOD)	Start Date
Otterpool Phase 2	**10011914**	**100.16**	**29/08/18**
Client	Easting (OS mE)	Northing (OS mN)	End Date
Folkestone and Hythe District Council	**611420.91**	**135791.53**	**29/08/18**

[TRIAL PIT NUMBER 228: GL- 1.70m]

[TRIAL PIT NUMBER 228: SPOIL]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT**	**SH**

ARCADIS Dynamic Sample Log

WS201

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**102.85**	**30/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611319.31**	**135672.56**	**30/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.20	D2	0.00	PID	<1ppm	
0.00 - 0.20	ES1	0.00	PID	<1ppm	
0.20 - 0.40	D4	0.20	PID	<1ppm	
0.20 - 0.40	ES3	0.20	PID	<1ppm	
0.40 - 0.60	D6	0.40	PID	<1ppm	
0.40 - 0.60	ES5	0.40	PID	<1ppm	
1.00 - 2.00	B7				
1.20 - 1.30	ES8	1.20	PID	<1ppm	
1.70 - 1.80	ES9	1.70	PID	<1ppm	
2.00 - 3.00	B10				
2.20 - 2.30	ES11	2.20	PID	<1ppm	
		2.20	HV(1)	20(10)kPa	
		2.64	HV(2)	22(10)kPa	
2.70 - 2.95	ES12	2.70	PID	<1ppm	
3.20 - 3.50	D13	3.20	PID	<1ppm	

STRATA				
Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Firm dark brown grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint and charcoal. [TOPSOIL]		(0.20) 0.20	102.65	
Orange brown clayey fine to medium SAND. [HEAD DEPOSITS]		(0.20) 0.40	102.45	
Soft orange brown very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.60) 1.00	101.85	
Soft fissured orangish brown sandy silty CLAY. Sand is fine to coarse. Fissures are closely spaced. [HEAD DEPOSITS]		(1.66) 2.66	100.19	
Firm yellowish brown mottled light brown very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS] Iron staining		(0.32) 2.98	99.87	
Weathered SANDSTONE recovered as firm yellowish brown sandy gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse sandstone. Cobbles are subangular to subrounded sandstone. [HYTHE FORMATION]		(0.52) 3.50	99.35	

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.50	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	3.50		

BACKFILL		
Top	Base	Backfill
0.00	0.50	Concrete
0.50	1.00	Bentonite
1.00	3.50	Sand

Remarks

Exploratory hole terminated due to refusal. Groundwater not encountered.

Termination Depth:
3.50m

AGS

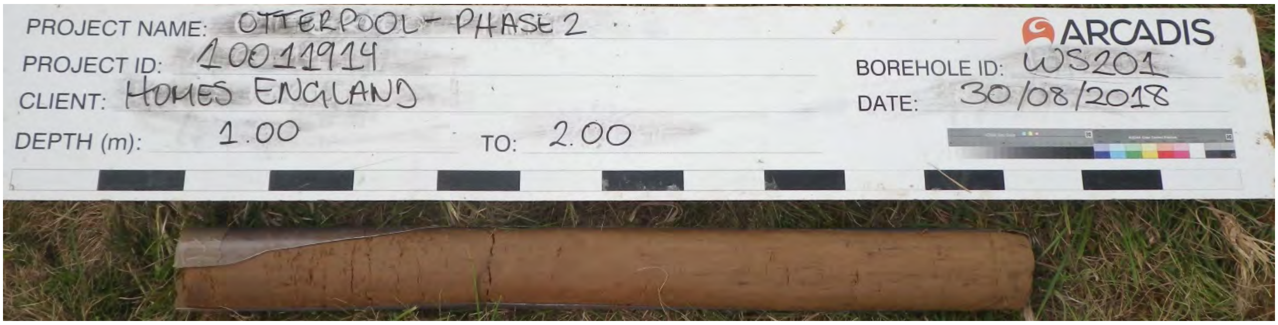
Arcadis Cymru House
St. Mellon's Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dart 302	**Arcadis Consulting (UK) Ltd**	**MT / IT**	**SH**

Windowless Sample Photography Sheet

Project	Job No	Ground Level (mAOD)	Start Date	
Otterpool Phase 2	**10011914**	**102.85**	**30/08/2018**	**WS201**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611319.308**	**135672.56**	**30/08/2018**	



[WINDOWLESS SAMPLE NUMBER 201: 1.00m-2.00m]

WINDOWLESS SAMPLE NUMBER 201: 1.00m-2.00m SPLIT]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Windowless Sample Photography Sheet

Project	Job No	Ground Level (mAOD)	Start Date	
Otterpool Phase 2	**10011914**	**102.85**	**30/08/2018**	**WS201**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611319.308**	**135672.56**	**30/08/2018**	

[WINDOWLESS SAMPLE NUMBER 201: 2.00m-3.00m]

[WINDOWLESS SAMPLE NUMBER 201: 2.00m-3.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

ARCADIS Dynamic Sample Log

WS202

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**106.43**	**30/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611295.76**	**135297.81**	**30/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.15 0.15 - 1.00	ES1 B3	0.00	PID	<1ppm		Grass over soft dark brown slightly gravelly silty sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine flint. [TOPSOIL]		(0.15) 0.15	106.28	
0.50 - 0.60	ES2	0.50	PID	<1ppm		Soft light brown mottled yellowish brown mottled orange brown very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.85)		
1.00 - 1.10 1.00 - 2.00	ES4 B5	1.00	PID	<1ppm				1.00	105.43	
						Soft multicoloured slightly gravelly fine SAND with bands of clay 1-3mm thick. Gravel is angular to subangular fine to medium sandstone. [HEAD DEPOSITS]				
1.50 - 1.60	ES6	1.50	PID	<1ppm				(1.00)		
2.00 - 2.10 2.10 - 2.35	ES7 D8	2.00	PID	<1ppm				2.00	104.43	
						Brown mottled orange brown and red brown slightly gravelly clayey fine SAND. Gravel is angular to subrounded fine to medium ironstone. [HEAD DEPOSITS]		(0.35)		
2.35 - 2.50 2.50 - 3.00	ES9 B10	2.35	PID	<1ppm				2.35	104.08	
						Soft becoming firm slightly sandy to very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.65)		
3.00 - 3.20 3.15 - 3.30	ES11 D15	3.00	PID	<1ppm				3.00	103.43	
						Firm light brown mottled dark brown and orange brown slightly silty slightly sandy gravelly CLAY. Gravel is mudstone. [HEAD DEPOSITS]		(0.40)		
3.40 - 3.70 3.50 - 4.20	ES12 D13	3.40	PID	<1ppm				3.40	103.03	
						Multicoloured clayey fine to coarse SAND. [HEAD DEPOSITS]		(0.80)		
4.20 - 4.30	ES14	4.20	PID	<1ppm				4.20	102.23	
						Weak light grey fine grained SANDSTONE. [HYTHE FORMATION]		4.30	102.13	
						Soft to firm multicoloured brown, orangish brown, brownish grey, reddish brown, dark grey and light grey sandy CLAY. Sand is fine to coarse. [HYTHE FORMATION]		(0.20) 4.50	101.93	
						No recovery.		(0.50)		
								5.00	101.43	

DRILLING TECHNIQUE			WATER OBSERVATIONS						HOLE/CASING DIAMETER				BACKFILL		
From	To	Technique	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	Top	Base	Backfill
0.00 1.20	1.20 5.00	Inspection Pit Window Sample							116	5.00			0.00 0.50 1.00	0.50 1.00 5.00	Concrete Bentonite Sand

Remarks

Terminated at scheduled depth. Groundwater not encountered.

Termination Depth:
5.00m

AGS Arcadis Cymru House St. Mellon's Business Park Cardiff CF3 0EY

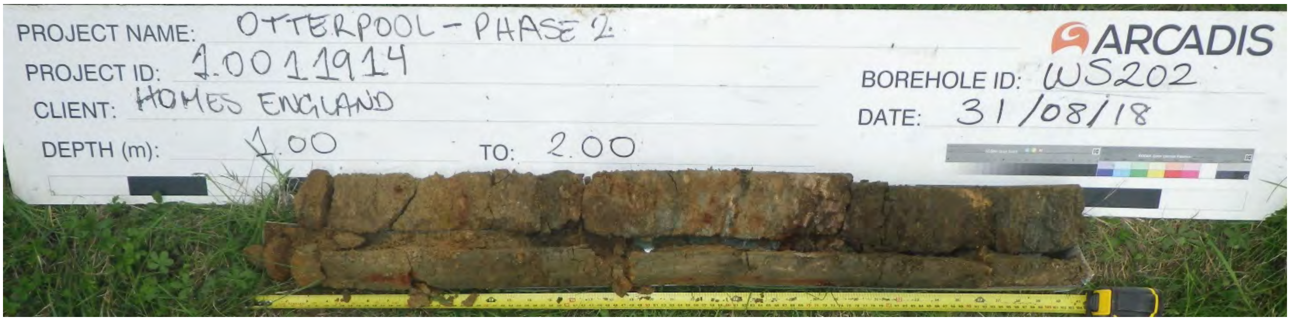
Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dart 302	**Arcadis Consulting (UK) Ltd**	**IT / MT**	**SH**

Windowless Sample Photography Sheet

Project	Job No	Ground Level (mAOD)	Start Date	
Otterpool Phase 2	**10011914**	**106.43**	**31/08/2018**	**WS202**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611295.761**	**135297.812**	**31/08/2018**	

WINDOWLESS SAMPLE NUMBER 202: 1.00m-2.00m]



[WINDOWLESS SAMPLE NUMBER 202: 1.00m-2.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Logged By	Checked By
JCB 3CX	**MT / IT**	**SH**

Windowless Sample Photography Sheet

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
611295.761

Ground Level (mAOD)
106.43
Northing (OS mN)
135297.812

Start Date
31/08/2018
End Date
31/08/2018

WS202

WINDOWLESS SAMPLE NUMBER 202: 2.00m-3.00m]

[WINDOWLESS SAMPLE NUMBER 202: 2.00m-3.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT / IT

Checked By
SH

Windowless Sample Photography Sheet

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
611295.761

Ground Level (mAOD)
106.43
Northing (OS mN)
135297.812

Start Date
31/08/2018
End Date
31/08/2018

WS202

WINDOWLESS SAMPLE NUMBER 202: 3.00m-4.00m]

WINDOWLESS SAMPLE NUMBER 202: 3.00m-4.00m SPLIT]

Arcadis Cymru House
St Mellons
Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT / IT

Checked By
SH

Windowless Sample Photography Sheet

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
611295.761

Ground Level (mAOD)
106.43
Northing (OS mN)
135297.812

Start Date
31/08/2018
End Date
31/08/2018

WS202

WINDOWLESS SAMPLE NUMBER 202: 4.00m-5.00m]

WINDOWLESS SAMPLE NUMBER 202: 4.00m-5.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT / IT

Checked By
SH

ARCADIS Dynamic Sample Log

WS203

Project	Project No.	Ground Level (mAOD)	Start Date	Scale
Otterpool Phase 2	**10011914**	**106.27**	**30/08/2018**	**1:50**
Client	Easting (OS mE)	Northing (OS mN)	End Date	
Folkestone and Hythe District Council	**611266.05**	**135243.45**	**30/08/2018**	**Sheet 1 of 1**

SAMPLES		TESTS			Water Strikes
Depth	Type/ No.	Depth	Type/ No.	Results	
0.00 - 0.20	ES1	0.00	PID	<1ppm	
0.20 - 0.50	B3				
0.50 - 0.60	ES2	0.50	PID	<1ppm	
0.50 - 1.00	B4				
1.00 - 1.20	ES5	1.00	PID	<1ppm	
1.10 - 1.40	D11				
1.40 - 1.60	ES6	1.40	PID	<1ppm	
1.50 - 1.78	D12				
1.80 - 2.00	ES7	1.80	PID	<1ppm	
1.90 - 2.00	D13				
2.20 - 2.30	ES8	2.20	PID	<1ppm	
2.35 - 2.45	ES9	2.35	PID	<1ppm	
2.50 - 2.80	D14				
2.80 - 3.00	ES10	2.80	PID	<1ppm	

STRATA Description	Legend	Depth (Thickness)	Level	Install/ Backfill
Dark brown slightly clayey fine to coarse SAND. [TOPSOIL]		(0.50) 0.50	105.77	
Yellowish brown fine to coarse SAND. [HEAD DEPOSITS]		(0.50) 1.00	105.27	
Soft yellowish brown very sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.40) 1.40	104.87	
Orangish brown slightly clayey fine to coarse SAND. [HEAD DEPOSITS]		(0.40) 1.80	104.47	
Soft reddish brown slightly sandy CLAY. [HEAD DEPOSITS]		(0.20) 2.00	104.27	
No recovery.		(0.20) 2.20	104.07	
Orangish brown mottled reddish brown sandy very gravelly CLAY with frequent iron pockets. Sand is fine to coarse. Gravel is subangular to subrounded fine flint. [HEAD DEPOSITS]		(0.15) 2.35	103.92	
Soft brown mottled orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine flint. [HEAD DEPOSITS]		2.45	103.82	
Soft yellowish brown sandy CLAY. Sand is fine to coarse. [HEAD DEPOSITS]		(0.55) 3.00	103.27	

DRILLING TECHNIQUE		
From	To	Technique
0.00	1.20	Inspection Pit
1.20	3.00	Window Sample

WATER OBSERVATIONS					
Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed

HOLE/CASING DIAMETER			
Hole Dia.	Depth	Casing Dia.	Depth
116	3.00		

BACKFILL		
Top	Base	Backfill
0.00	0.50	Concrete
0.50	1.00	Bentonite
1.00	3.00	Sand

Remarks

Exploratory hole terminated due to refusal. Groundwater not encountered.

Termination Depth:
3.00m

AGS Arcadis Cymru House St. Mellon's Business Park Cardiff CF3 0EY

Unless otherwise stated:
Depth (m), Diameter(mm),Time (hhmm), Thickness (m), Level (mOD).

Equipment Used	Contractor	Logged By	Checked By
Dart 302	**Arcadis Consulting (UK) Ltd**	**IT**	**SH**

Windowless Sample Photography Sheet

Project **Otterpool Phase 2**	Job No **10011914**	Ground Level (mAOD) **106.27**	Start Date **30/08/2018**	**WS203**
Client **Folkestone and Hythe District Council**	Easting (OS mE) **611266.046**	Northing (OS mN) **135243.448**	End Date **30/08/2018**	

WINDOWLESS SAMPLE NUMBER 203: 1.00m-2.00m]

[WINDOWLESS SAMPLE NUMBER 203: 1.00m-2.00m SPLIT]

Arcadis Cymru House
St Mellons Business Park
Cardiff
CF3 0EY

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used **JCB 3CX**	Logged By **MT / IT**	Checked By **SH**

Windowless Sample Photography Sheet

Project
Otterpool Phase 2
Client
Folkestone and Hythe District Council

Job No
10011914
Easting (OS mE)
611266.046

Ground Level (mAOD)
106.27
Northing (OS mN)
135243.448

Start Date
30/08/2018
End Date
30/08/2018

WS203

[WINDOWLESS SAMPLE NUMBER 203: 2.00m-3.00m]

WINDOWLESS SAMPLE NUMBER 203: 2.00m-3.00m SPLIT]

Unless otherwise stated:
Depth (m), Diameter (mm), Time (hhmm), Thickness (m), Level (mOD).

Equipment Used
JCB 3CX

Logged By
MT / IT

Checked By
SH