



Phase II Geo-Environmental Assessment

Saltbox

Shripney Road
Bognor Regis
PO22 9NW

Prepared for:

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The National Planning Policy Framework requires a competent person to prepare site investigation information, which is defined as a person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation. EPS considers that it fulfils these criteria and would welcome any request for staff CVs or case studies to demonstrate it.

As stated within DEFRA's Contaminated Land Statutory Guidance, with any complex risk assessment it is possible that different suitably qualified people may reach slightly different conclusions when interpreting the same information. EPS recognises this and considers the conclusions presented within this report to be robust and appropriate but input from the Local Authority and their judgement in line with this guidance would still be welcomed.



SALTBOX, BOGNOR REGIS

NON-TECHNICAL CLIENT SUMMARY

This report presents the findings of a Phase II Geo-Environmental Assessment undertaken to provide an initial assessment of the prevailing ground conditions, establish if there are any environmental risks associated with the site and its development and provide a geotechnical appraisal. Pertinent findings and conclusions may be summarised as follows:

- The site comprises an open, undeveloped field, which is currently used as arable farmland. This land use has remained largely consistent throughout the recorded history, although a small barn was formerly present towards the centre of the southern boundary, which was demolished sometime in the late 1950's.
- Ground conditions are indicated to comprise River Terrace Deposits (sand, silt and clay) overlying the Lewes Nodular Chalk, both of which are considered to have notable potential as a groundwater resource and despite limited former use, the site is situated in a relatively sensitive setting, with nearby drainage channels also marking the northern and eastern boundaries.
- Intrusive investigations involved the drilling of two deep boreholes formed to 20.0m and the installation of two ground water monitoring standpipes as well as the excavation of ten shallow trial pits and completion of five soakaway tests at various locations. Underlying geology was found to comprise topsoil overlying clay underlain in turn by chalk which came in at between 3-4m. Groundwater was encountered between 1.8m and 4.0m depth but found to rest at roughly 2.0m.
- Analysis of shallow soils confirmed the absence of any contamination that could pose a plausible risk to human health or water resources and the shallow soils across the site are considered suitable for the proposed end use. No further environmental assessment is considered necessary.

ENGINEERING SUMMARY

- Whilst the natural shallow soils are possibly suitable for the use of conventional spread foundations, allowable bearing pressures are likely to be particularly limited (40kN/m^2) and should be confirmed through further ground investigation if this is the preferable solution.
- The use of piles could also be considered, with a number of floor slab options also presented in this report and the feasibility of each should be confirmed through more detailed assessment.
- Laboratory CBR testing of sub-grade has produced varied results, with an adoptable value of 2% being recommended at this stage.
- A design sulphate class of DS-1 is considered suitable for the site, with an aggressive chemical environment for concrete (ACEC) of AC-1.

The above points represent a simplified summary of the findings of this assessment and should not form the basis for key decisions for the proposed development. A thorough review of the details is contained within the following report, or alternatively get in touch and we'll talk you through it.

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1 INTRODUCTION

In November 2017, Environmental Protection Strategies Ltd (EPS) was commissioned by Kirk Saunders on behalf of David Langmead to complete a Phase II Geo-Environmental Assessment at Saltbox, Shripney Road, Bognor Regis, PO22 9NW ('the site'). A site location plan is presented as Figure 1.

The work was commissioned in order to provide an initial assessment of the prevailing ground conditions for a potential commercial development comprising a number of trade and retail units.

This report presents the findings, conclusions, and recommendations of a previous Phase I Desk Study and subsequent Phase II Intrusive Investigation undertaken.

1.1 Objectives

The objectives of this investigation were as follows:

- a) Investigate potential contaminant linkages identified through the CSM by means of investigating shallow soils.
- b) Determine the potential risks posed by the site and make recommendations for further work that may be required, to ensure safe development in accordance with the Model Procedures for the Management of Land Contamination - *Contaminated Land Report 11* and the *National Planning Policy Framework (2012)*.
- c) Collect preliminary information on ground conditions to make appropriate recommendations for the feasibility of proposed land use.

1.2 Scope of Work

To perform an exploratory assessment of the site in accordance with the principles and requirements of DEFRA's '*Contaminated Land Statutory Guidance*' (2012), BS10175:2011 – '*Investigation of Potentially Contaminated Sites*' the following tasks were undertaken:

Intrusive Investigation:

- Site walkover, inspection of any visual evidence of contamination, obtaining photographic records.
- Health and safety briefing / site supervision.
- Excavation of ten trial pits to a maximum depth of 2.0m below ground level (bgl).
- Completion of soil infiltration tests at five of the trial pit positions.
- Drilling of two boreholes using a cable percussive drilling rig to a depth of 20m bgl and the installation of two monitoring standpipes.
- Installation of a data logger in one of the borehole positions to collect information on groundwater levels over an extended period of approximately one month.
- Continual logging of ground conditions including inspection of samples for visual and olfactory contamination, and laboratory analysis of selected representative samples.

Reporting:

- Data collection and interpretation.
- Reporting.

The findings of these investigations and their conclusions are presented in the following sections.

1.3 Limitations and Constraints

The purpose of this report is to present the findings of shallow soil sampling investigation conducted at the location(s) specified. When examining the data collected from the investigations made during the assessment, Environmental Protection Strategies Ltd (EPS) makes the following statements:

No investigation method is capable of completely identifying all ground conditions that might be present in the soil or groundwater under a site. Where outlined in our report, we have examined the ground beneath a site by constructing a number of boreholes and / or trial pits to recover soil and / or groundwater samples. The locations of these excavations and sampling points are considered to be representative of the condition of the whole site subsurface however, ground conditions are naturally variable and it may be possible that the ground conditions encountered may differ to those encountered during the investigation.

No visible evidence of Japanese Knotweed was identified during the site walkover. However, this plant can be difficult to identify in the early stages of growth and therefore it is not always possible to identify its presence at certain times of the year. For this reason, EPS cannot confirm that Japanese Knotweed rhizomes do not exist and it is recommended that if it is suspected that this species, or other similarly invasive plants are present at the site, a specialist contractor should be commissioned to make a detailed assessment.

This report does not include specific investigation for the presence of Potential Asbestos Containing Material (PACM). Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected.

The investigation was carried out to assess the significance of contamination resulting from the use of the site as identified in this report. Unless EPS has otherwise indicated, no assessment of potential impact of any other previous uses has been made.

2 ENVIRONMENTAL SETTING

The following section provides a summary of the information collected in relation to the site location and its environmental context.

2.1 Background and Previous Reports

This investigation supplements a Phase I Desk Study undertaken for the site by EPS in June 2017. The key findings of this report are briefly summarised in Section 2.4 of this report, however, for more detailed background information, it is recommended that the reader reviews the following document:

- *UK17.2707 Phase I Geo-Environmental Assessment, Saltbox, Bognor Regis (Issue 1) - 9th June 2017*

2.2 Site & Location Description

Detail	Description
Location	The site is located on the southern outskirts of Shripney, a small village situated around 2.5km north east of Bognor Regis town centre.
National Grid Reference	493810, 101630
Topographic Elevation	Approximately 5m Above Ordnance Datum (AOD).
Topographic Gradient	Approximately 1-2m Above Ordnance Datum (AOD) with levels sloping gently towards the south west.
Site Description	The area currently comprises a roughly rectangular parcel of land that is slightly wider towards its southern boundary and is used as an arable field. The area is accessed off Shripney Road via a formal gateway, present towards the centre of the eastern boundary. No formal structures are noted within the site limits, which are all marked with low level shrubs or hedgerows.
Surrounding Land Use	The site is located within an area of fairly limited development, with the majority of surrounding land also used for agricultural purposes. However, a caravan site is situated to the south, with a series of residential dwellings present adjacent to its north-eastern corner, along Shripney Road, which runs parallel to the eastern boundary. A notable commercial estate is located around 450m south and south east and comprises a series of large standalone units.

A plan showing the site location is provided as Figure 1 and selected site photographs are included as Appendix A. In addition, proposed development plan is included as Appendix B.



2.3 Environmental Setting

Detail	Description
Geology	Geological maps of the area indicate the ground conditions to comprise River Terrace Deposits (comprising clay, silt and sand) overlying the Lewes Nodular Chalk Formation.
Hydrogeology	Groundwater vulnerability maps for the area show that the underlying superficial geology is classified as a Secondary Aquifer with the Lewes Nodular Chalk Formation classified as a more sensitive Principal Aquifer. The site does not lie within a Source Protection Zone (SPZ) for groundwater abstraction.
Hydrology	The nearest surface water feature is a drainage channel which runs along the northern and western boundaries of the study area. Further ditches are networked to the east, west and south respectively, the majority of which join a more significant stream around 1.2m south east, which flows in a generally southerly direction.

2.4 Desk Study Conclusions and Recommendations

The results of the preliminary risk assessment indicated the study area to be relatively low risk, given that the primary source of contamination identified was demolition materials associated with a former building, removed over 50 years ago. Therefore, given the context of the site, and the nature of the proposed development, no specific environmental assessment was recommended aside from the removal of any isolated areas of made ground (if encountered), as well as implementation of standard health and safety precautions as applicable to construction workers involved in the redevelopment works.

However, given that ground investigation works was instructed to assist with geotechnical design and waste soil removal or reuse, some confirmatory sampling was also conducted, to provide support for the conclusions drawn from the previous phase of assessment.

3 SUMMARY OF INTRUSIVE INVESTIGATIONS

The intrusive ground investigation was undertaken on the 21st November– 23rd November 2017 in accordance with EPS standard operating procedures, copies of which will be made available on request. A summary of the site activities is presented in the following sections:

3.1 Exploratory Hole Locations

Exploratory hole locations were selected through consideration of the proposed end use, the findings of the conceptual site model outlined in the previous desk study, the location of below ground utilities as well as operational and health & safety considerations.

The overall objective in terms of exploratory hole location was to provide an initial assessment of the subsurface soils across the site with regards to the feasibility of a future commercial development comprising a number of trade and retail units. Further rationale for each sampling location is provided within the table below:

Location	Maximum Depth (m bgl)	Rationale
BH1-BH2	20.0	Provide information on the nature and quality of underlying soils, particularly at depth, to assist with geotechnical design and facilitate the installation of monitoring standpipes so that groundwater level data could be recorded by a data logger and field engineer.
SA1 - SA5	2.0	To provide an initial assessment of the infiltration characteristics of the shallow soils across the site to inform likely surface water drainage strategy.
TP1-TP10	2.0	Provide general site coverage regarding the nature of the ground conditions and the quality of shallow soils.

A borehole and trial pit location plan is presented as Figure 2.

3.2 Soil Sampling & In-Situ Testing

Each exploratory hole was logged for ground conditions encountered and inspected for any physical evidence of contamination, such as soil staining, odour and the presence of separate phase liquids on a precautionary basis.

Selection of samples for laboratory analysis focused on providing an initial assessment of shallow ground conditions where future construction workers and future site users are anticipated to have most frequent exposure to this material.

Where potentially volatile organic compounds are suspected, EPS carries a Photoionisation Detector (PID), which can be used to measure the relative concentrations of vapour associated with soil samples collected from different depths and locations at the site. PID readings are only used to provide EPS with a basic means to quantify areas of volatile organic compound in the field



to help guide the investigation. However, given that no visual or olfactory evidence of impacted soils was encountered throughout the investigation, vapour monitoring was not conducted.

Alternating standard penetration tests (SPTs) and undisturbed samples were obtained at approximately 1m intervals within the deep cable percussive boreholes (BH1-BH2). For the SPT test, the number of blows required to advance a standard split spoon, over the final 300mm of a 450mm total drive was recorded, and is shown on the borehole records at the penetration resistance ("N" value).

A laboratory testing schedule is included as Table 1.

3.3 Laboratory Testing

Samples obtained for analysis of identified contaminants of concern were submitted to Jones Environmental Forensics Ltd of Deeside, who hold appropriate UKAS / MCERT accreditation for the required testing. Samples were transported in laboratory supplied containers and delivered to the laboratory by approved courier.

Geotechnical testing was undertaken by Soil Property Testing, Huntingdon, a UKAS accredited laboratory.

Copies of chain of custody documentation for the laboratory are held by EPS and will be made available on request.

4 FINDINGS OF THE INVESTIGATION

This section of the report provides a summary of the findings of the initial intrusive investigations undertaken at the site.

4.1 Ground Conditions

A total of two boreholes and ten trial pits were formed and the ground conditions encountered, from ground level, were interpreted to comprise:

- Topsoil
- River Terrace Deposits
- Lewes Nodular Chalk Formation

Site specific borehole and trial pit logs are included as Appendix C and give descriptions and depths of strata encountered. A summary of the general strata encountered across the site is provided in the table below, with more detailed description given in the following sub sections.

Geological Strata	Maximum Depth to Base of Strata (m bgl)	Strata Thickness (m)
Topsoil	0.6	0.4-0.6
River Terrace Deposits	4.0	2.6-3.4
Lewes Nodular Chalk Formation	>20.0	Not Proven

4.1.1 Topsoil

A soft yellowish dark brown silty clayey topsoil with rare fine and medium flint gravel and recently active roots was encountered from the surface at all exploratory hole locations to a maximum depth of 0.6m.

4.1.2 River Terrace Deposits

Soils interpreted as River Terrace Deposits were recorded directly beneath the topsoil in BH1-BH2, TP1-TP4 and TP7-TP10 and extended to beyond the maximum depth of drilling. These materials comprised soft to firm yellowish brown, slightly sandy silty clay with rare fine and medium flint gravel overlying soft mottled light grey and pale olive slightly gravelly sandy chalky clay with fine to coarse chalk and flint fragments.

4.1.3 Lewes Nodular Chalk Formation

Directly beneath the River Terrace Deposits were soils considered to be representative of the Lewes Nodular Chalk Formation. These soils were typically described as structureless chalk in a soft to firm white slightly clayey, gravelly sandy silty matrix with occasional large subangular to subrounded flint and gravel fragments (CIRIA Grade Dm).



4.2 Groundwater

Groundwater was encountered at several locations (BH1, BH2, TP4 and TP5) during the intrusive investigation between 1.8m and 4.0m but was found to rest at around 2.0m upon completion of the investigation.

A Rugged TROLL 200 Data Logger was installed in BH1 on the 22nd November - 21st December 2017 to monitor groundwater levels over an extended period. Recordings show a general shallowing of groundwater levels during the period with some suggestion of rainfall influence. During this period groundwater was found to range between 1.37m and 2.17m. These results of this morning sequence are included as Appendix D.

4.3 Physical Evidence of Contamination

No visual or olfactory evidence of impacted materials were identified at any of the intrusive locations, with all of the recovered soils appearing as natural deposits. In addition, no other palpable evidence of contamination including waste or putrefiable material was encountered in any of the positions formed during this initial phase of ground investigation works.

4.4 Laboratory Analysis – Soil

A laboratory analysis testing schedule is presented as Table 1 and all environmental sample results obtained from the laboratory are included as Appendix E. The key results of laboratory testing on environmental soil samples are summarised below.

Contaminant	No. of Samples	No of Detections	Range of Detections (mg/kg)		Highest Location & Depth (m bgl)
			Min	Max	
Arsenic	6	6	5.0	11.5	TP1 (0.4-1.0)
Cadmium	6	5	0.2	0.8	TP5 (1.0-2.0)
Chromium III	6	6	6.2	61.4	TP1 (0.4-1.0)
Chromium VI	6	0	-		
Copper	6	6	4	13	TP1 (0.4-1.0)
Mercury	6	0	-		
Nickel	6	6	7.3	34.4	TP1 (0.4-1.0)
Lead	6	5	10	16	TP4 (0.0-0.4)
Selenium	6	1	1		TP1 (0.0-0.4)
Zinc	6	6	26	61	TP4 (0.4-1.0)
PAH (Total of 16)	6	0	-		
Naphthalene	6	0	-		
Benzo(a)pyrene	6	0	-		
Dibenzo(ah)anthracene	6	0	-		
Total TPH	3	0	-		
MTBE	3	0	-		
BTEX	3	0	-		
ACM (mass %)	6	0	-		

Notes:

-	Contaminant not identified above	MDL	ACM	Asbestos Containing Material
BTEX	Benzene, Toluene, Ethylbenzene & Xylenes		MTBE	Methyl Tert Butyl Ether
PAH	Polycyclic Aromatic Hydrocarbons		TPH	Total Petroleum Hydrocarbons

- Low concentrations of the majority of heavy metals were identified within all shallow soil samples.
- Individual PAH compounds were rarely detected above the minimum laboratory detection limit (MDL) within the majority of the samples submitted for laboratory analysis.
- No trace of Asbestos Containing Materials (ACM) was identified within any samples submitted for laboratory analysis.

4.5 Waste Classification

Waste analysis has been carried out on three samples, representative of topsoil and the underlying natural strata (River Terrace Deposits and Lewes Nodular Chalk Formation). These materials were considered to be most representative of the ground profile across the area, and therefore to be generated in the largest volumes during any future groundworks.

Waste Acceptance Criteria (WAC) analysis was completed in order to provide information on the most appropriate method of disposal for these materials. This information is summarised within the table below and the results of environmental laboratory analysis, (including WAC tests) are included as Appendix E.

Waste classification (i.e. hazardous or non-hazardous) was also undertaken using computer software provided by HazWaste OnlineTM. The results of this analysis are also summarised within the table below and the output from the HazWaste OnlineTM software is included as Appendix F.

Location	Depth (m bgl)	Description	Is it Hazardous?	Waste Acceptance Criteria	Waste Classification
TP1	0.0-0.4	Soft yellowish dark brown silty clayey TOPSOIL.	No	Passed Criteria for Inert Landfill	INERT
TP1	0.4-1.0	River Terrace Deposits: Soft to firm yellowish brown slightly sandy silty CLAY overlying soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY.	No	Failed Criteria for Inert Landfill	NON – HAZARDOUS
TP5	1.0-2.0	Lewes Nodular Chalk: Structureless CHALK in a soft to firm white slightly clayey gravelly sandy silty matrix.	No	Passed Criteria for Inert Landfill	INERT

On this basis, material representative of Topsoil and Lewes Nodular Chalk Formation beneath the site should be classified as **Inert** for the purposes of offsite disposal. However, at this stage, the predominantly clay based materials indicative of Superficial River Terrace Deposits should be classified as **Non-Hazardous**, due to significantly elevated concentration of Total Dissolved Solids within the eluate analysis.

It should be noted that the ultimate decision on acceptance criteria will lie with chosen waste receiver, although it may be prudent to confirm this (or an improved position) through supplementary testing during future ground investigation works, particularly for the superficial material present across the site; which can be particularly variable and is often reflected in the laboratory data.

4.6 Geotechnical Testing

The results of geotechnical laboratory testing are summarised in the table below.

Strata	Range of Parameters					
	Moisture Content (%)		Plasticity Index (%)		CBR Value (%)	
	Min	Max	Min	Max	Min	Max
River Terrace Deposits (cohesive soils)	16	28	6 (5)	25	1.4	2.8
Lewes Nodular Chalk Formation	23*	25*	-		-	

() indicates plasticity index modified for granular content

* indicates saturated moisture content

The natural moisture content was established for nine samples of cohesive soil in accordance with BS1377 Part 1:7.3 and BS1377: Part 2:3.2.

Atterberg limit tests were undertaken on nine samples of cohesive soils in accordance with BS1377: Part 1:7.4 and BS1377: Part 2:3.2&4.2.

California Bearing Ratio (CBR) tests were scheduled for three samples of shallow soils in accordance with BS 1377: Part1, 4:1990:7.4.

Triaxial tests (single stage) were completed for one sample of predominantly cohesive soils in accordance with BS1377: Part 7: 1990: 8.

Sulphate contents and pH values determinations were also carried out by the geotechnical laboratory, the results of which are summarised in section 6.6.

A laboratory analysis testing schedule is presented as Table 1 and all geotechnical sample results obtained from the laboratory are included as Appendix G.

5 ENVIRONMENTAL APPRAISAL

The following section outlines the approach applied to assessing the risks posed to human health and controlled waters through a Generic Quantitative Risk Assessment, then identifies any sample results found by this investigation which warrant further consideration.

5.1 Human Health

5.1.1 Land Use Setting & Generic Screening

It is understood that the site will be redeveloped for commercial use in the form of a number of trade and retail units. In order to screen laboratory data for concentrations of contaminant in soil with potential to cause harm to human health at a commercial setting, relevant generic screening values have been used. These values are all based on suitable for use criteria for contaminants in soil and are considered most representative of the current scheme. The technical framework used to derive the screening values and the documents in which they are published are summarised as follows:

- *EA Science Reports* (SC050021/SR2, SC050021/SR3, and SC050021/SR7)
- *EA Soil Guideline Value Science Reports*
- *Suitable for Use Levels (S4ULs) for Human Health Risk Assessment – LQM and CIEH* (2015)
- *Soil Generic Assessment Criteria for Human Health Risk Assessment - EIC/AGS/CL: AIRE* (2010)
- *Development of Category 4 Screening Levels for assessment of land affected by contamination - SP1010 – DEFRA* (2013)

A summary of the screening criteria and the methodology used to derive them is included in Appendix H.

5.1.2 Assessment of Results

The results of the screening process for on-site human receptors showed that screening criteria representative of suitability limits, assessing risk to future site users were not exceeded for any contaminant at any location.

5.2 Controlled Waters

5.2.1 Generic Screening

In addition to screening the concentrations of contaminants in soil for risks to human health, EPS has also screened the concentrations for potential to cause harm to water resources. The criteria used for this process were derived by EPS using the following technical guidance:

- *Environment Agency Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination.*



Resource Sensitivity of Area	Basis of Tier 1 Criteria
High Groundwater Resource Potential (HGwRP) - Principal aquifers	UK Drinking Water Standards (UKDWS)
Low Groundwater Resource Potential (LGwRP) - Secondary aquifers not being abstracted and Un-productive groundwater strata	UK Environmental Quality Standards (EQS)

Screening criteria for High Groundwater Resource Potential (HGwRP) have been adopted for this site due to the underlying bedrock (chalk) being classified as a sensitive Principal Aquifer.

5.2.2 Assessment of Soil Results – Controlled Waters

The results of the screening process for controlled waters show that the screening values for High Groundwater Resource Potential (HGwRP) were not exceeded in any of the samples analysed.

5.3 Management of Contaminated Land

The results of this risk assessment process have not identified any evidence of soil contamination which warrants further consideration. This confirms the position taken as a result of the preliminary risk assessment produced by EPS in June 2017. Whilst on the basis of the findings of the investigation, the likelihood of encountering significant contamination is considered unlikely, should any palpable evidence of unexpected contamination be encountered during the proposed redevelopment work, it should be reported to EPS so that an inspection can be made and appropriate sampling and assessment work carried out. A method statement for encountering any unexpected contamination is included as Appendix I of this report.

In accordance with the *Model Procedures for Management of Land Contamination (Contaminated Land Report 11)*, the risks identified by this work will not require further assessment. A summary of the approach outlined in CLR11, marking the work already completed under the risk assessment phase, is presented as a flow diagram in Figure 3 of this report.

It is also recommended that a copy of this report be provided to the Environmental Health Department of Arun District Council for inclusion in their land quality records.

6 GEOTECHNICAL APPRAISAL

The findings of this initial assessment have indicated ground conditions across the site to comprise topsoil overlying slightly chalky gravelly sandy silty clay (River Terrace Deposits) underlain by structureless chalk in a soft to firm white slightly clayey gravelly sandy silty matrix (Lewes Nodular Chalk Formation).

6.1 Structural Foundations

6.1.1 *Spread Foundations*

Whilst at this stage, the site and ground conditions are considered to be theoretically suitable for the use of conventional spread foundations bearing upon the River Terrace Deposits, allowable bearing pressures will only be very low due to the low strength of the shallow soils. An allowable bearing pressure of a maximum of 40kN/m^2 is considered suitable at a depth of around 1m below existing ground level, with only a very modest increase in this with depth. The allowable bearing capacity is the permissible increase in vertical stress at the level of the underside of the foundation, above existing overburden pressure, which may be calculated on the basis of a soil density of 18kN/m^3 . Consideration could be given to further investigation of the shallow soils (particularly to provide additional lateral coverage), if required, to provide a more detailed assessment of the potential use of spread foundations.

At the above allowable bearing capacities, total settlements may be in the magnitude of roughly 20-25mm. Settlements in cohesive soils will likely comprise both immediate settlement and consolidation settlement.

A minimum foundation depth of 0.9m, is considered suitable for the site, below existing or proposed ground level, subject to the following provisos:

- a) The cohesive soil (clays) will be subject to volume change, (subsidence and / or heave) due to the presence of trees. Foundation design will therefore need to take into account the presence of trees, both those to remain and those to be planted as well as to be removed from site. The cohesive soils should be considered as having a 'medium volume change potential' in accordance with NHBC Standards Chapter 4.2 'Building Near Trees'.

It is recommended that a full survey is undertaken of any trees/vegetation on or close to the site in order that the impact of these may be taken in to account in foundation design.

6.1.2 *Piles*

Should structural loads exceed the preliminary allowable bearing capacities advised in Section 6.1.1 above (which is considered quite likely), then the use of a deep foundation solution, such as piles could be considered.

The ground conditions are considered suitable for the use of bored or driven piles. It is likely that if bored piles were adopted, these would have to be cased through water bearing soils, as identified at varying depths throughout the profile of the Superficial River Terrace Deposits. Furthermore, the use of driven piles may cause noise and vibration nuisance to site neighbours and may ordinarily negate their use. The pile type should take into account the presence of groundwater, which has been identified at level of approximately 1.37m and 2.17m across certain sections of the study area

(however, it is recognised that this could become shallower over time). Therefore, care must be taken to ensure that the piling method provides sound piles below groundwater.

In view of the wide variety of piles sizes available, and the range of installation plant and techniques, the design of the piles should be carried out by, and should remain the responsibility of the specialist piling contractor, who will reflect their own methods, experience and design procedures within their proposals.

6.2 Ground Floor Construction

As floor slabs for the type of building intended are likely to be quite sensitive to movements and given the presence of relatively low strength and shrinkable soils encountered, suspended ground floor construction would normally be considered most appropriate with the incorporation of a suitable sub-floor void.

However, it is recognised that suspended ground floor construction may well be both uneconomic and difficult for such large structures and therefore consideration could be given to the following:-

- Piled ground floor slab, although this could again be costly.
- Removal of a proportion of the near surface shrinkable soils and its replacement with a controlled and compacted granular fill, and subject to the influence of any trees/vegetation, to allow the adoption of ground bearing floor slab. This will require the removal and potential disposal of significant volumes of soil and will also induce settlements in the underlying cohesive soils, which may well not be tolerable.
- Improvement of the load bearing characteristics of the shallow soils through cement/lime stabilisation.

Further investigation is recommended to further characterise the shallow soils and assess floor slab construction options.

6.3 External Works

6.3.1 Pavement Design

Laboratory CBR testing was undertaken on three shallow samples representative of sub-grade in predetermined locations and gave varied CBR values of between 1.4% and 2.8%. The results of these tests are included within Appendix G.

These CBR values are likely to be due to the cohesive nature of shallow soils encountered therefore a design CBR value of 2% is considered appropriate at this stage. This value is also given with reference to the *Department of Transport Design Manual for Roads and Bridges, Volume 7, Pavement Design and Maintenance*.

Given the likely extensive nature of paved areas throughout the proposed development, further in-situ CBR testing is recommended to confirm design values, once final positioning and levels are determined.

6.4 Groundworks

Whilst excavations in the cohesive soils may remain stable for only very short periods during construction, the long term stability of excavations should not be relied upon particularly given the low strength of these soils and the relatively shallow presence of groundwater.

Heavy plant and stockpiles of materials should not be permitted close to the edges of unsupported excavations.

Further reference should be made to CIRIA Report No. 97 'Trenching Practice' 1992.

Groundwater was encountered at several locations (BH1, BH2, TP4 and TP5) during the intrusive investigation between 1.8m and 4.0m but was found to rest at around 2.0m upon completion of the investigation. At these depths, ground water ingress is likely to be moderate and some form of groundwater control is likely to be required.

6.5 Drainage

Soakaway tests were undertaken at five locations across the site, in general accordance with BRE Digest 365. Infiltration rates are summarised in the table below:

Location & Depth (mbgl)	Indicative Infiltration Rate (m/s)		
	Test 1	Test 2	Test 3
SA1 (2.0)	4.71×10^{-7}	5.78×10^{-7}	Not Calculable
SA2 (1.5)	2.74×10^{-6}	2.57×10^{-6}	2.21×10^{-6}
SA3 (1.0)	Not Calculable	Not Calculable	-
SA4 (1.5)	1.58×10^{-6}	1.24×10^{-6}	-
SA5 (1.0)	1.51×10^{-6}	1.12×10^{-6}	-

The infiltration rates recorded are considered to be indicative of very low to practicably impermeable soils and are likely to have been influenced by the presence of both clay and groundwater.

6.6 Concrete Grade

Sulphate contents and pH values determinations were carried out by the geotechnical laboratory, the results of which are also included within Appendix G. Results for concrete grade testing are summarised within the following table:

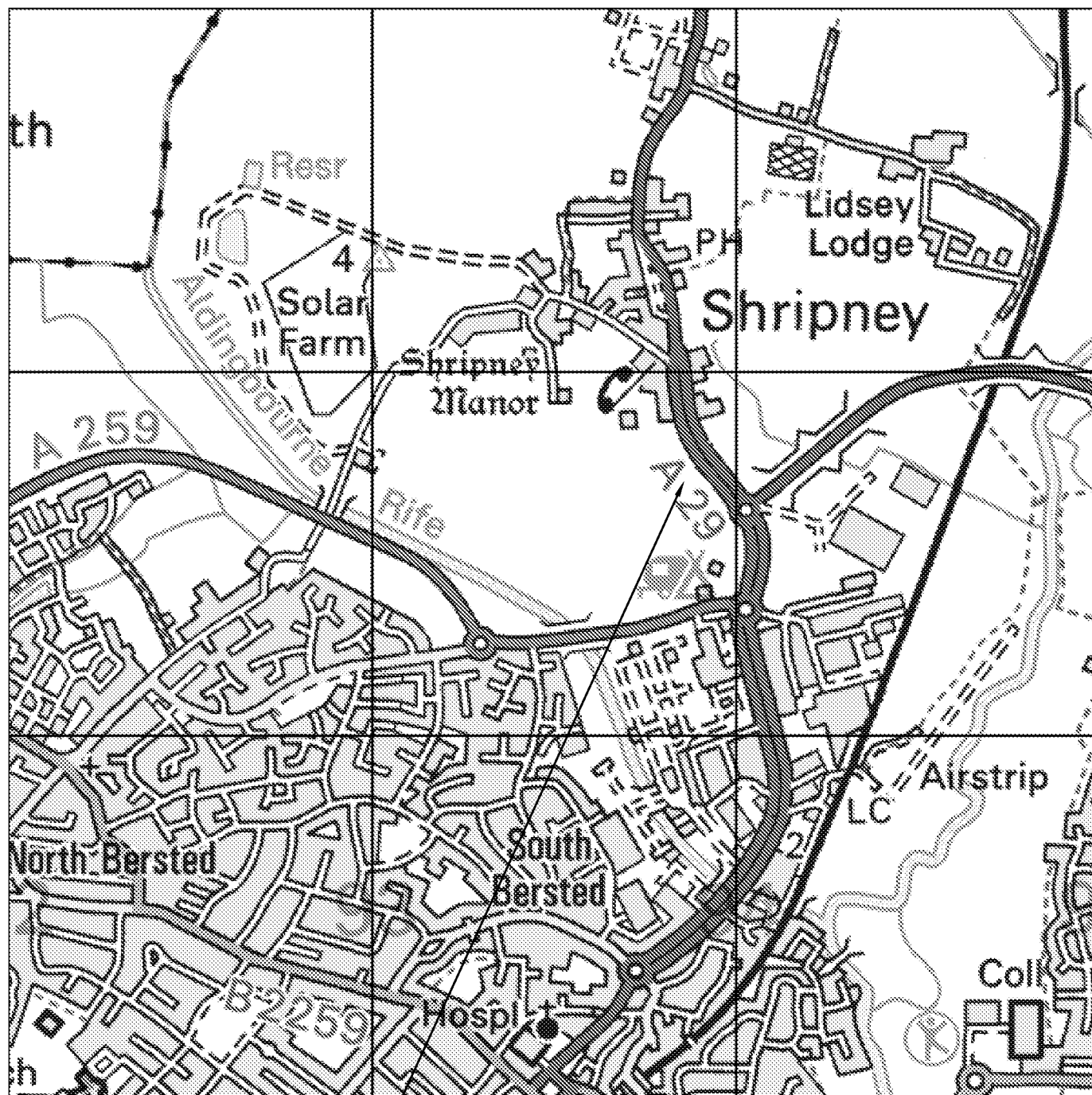
Strata	Water soluble Sulphate (g/l SO ₄)		pH	
	Min	Max	Min	Max
River Terrace Deposits	0.0240	0.0840	8.0	8.2
Lewes Nodular Chalk Formation	0.0960		7.8	

In accordance with Part 1 of the BRE Special Digest 1 'Concrete in Aggressive Ground' 2005, a design sulphate class of DS-1 is considered suitable for concrete in direct contact with the River Terrace Deposits and Lewes Nodular Chalk Formation encountered at the site, with an aggressive chemical environment for concrete (ACEC) of AC-1.

Should stabilisation (cement/lime) be considered for floor slab construction, further detailed assessment of the presence of sulphates will be necessary, as these can have a significant effect on the performance of such stabilisation.



FIGURES



Approximate Site Location

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Licence Number: 100054115



Title: Site Location Plan

Project: Saltbox, Shripney Road,
Bognor Regis, PO22 9NW

Fig No: 1

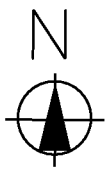
Scale: NTS

Drawn By: SC **Approved By:** WE

Job No: UK17.2707B

Dwg No: Bognor/1217/01

Date: December 2017



KEY:

- Approximate Site Boundary
- Approximate Borehole Location
- Approximate Soakaway Location
- Approximate Trial Pit Location

Fig:	2
Title:	Intrusive Investigation Location Plan
Project:	Saltbox Site, Bognor Regis
Client:	Kirk Saunders
Scale:	NTS - For Illustration purposes only
Drawn By:	SC
Job No:	UK17.2707B
Date:	November 2017





TABLES



Table 1 – Laboratory Testing Schedule

Sample ID	Sample Depth (m bgl)	EPS Mini Suite	PH & Sulphates	Moisture Content	Atterberg Limits	CBR	Triaxial
BH1	2.5	-	-	1	1	-	-
BH1	16.5	-	-	*1	1	-	-
BH2	1.2	-	-	-	-	-	1
BH2	1.7	-	-	1	1	-	-
BH2	2.5	-	1	1	1	-	-
BH2	7.5	-	1	*1	1	-	-
TP1	0.0-0.4	-	-	-	-	-	-
TP1	0.0-0.8	-	-	1	1	1	-
TP1	0.4-1.0	-	-	-	-	-	-
TP1	1.8-2.0	-	-	-	-	-	-
TP4	0.0-0.4	1	-	-	-	-	-
TP5	0.0-0.8	-	-	1	1	1	-
TP5	1.0-2.0	-	-	-	-	-	-
TP6	0.0-0.3	1	-	-	-	-	-
TP7	1.3-1.5	-	1	-	-	-	-
TP8	0.0-0.5	1	-	-	-	-	-
TP8	0.0-0.8	-	-	1	1	1	-
TP8	0.8-1.0	-	-	1	1	-	-

Notes:

mbgl meters below ground level
1 Sample Taken
- Sample Not Analysed
EPS Mini Suite Organic Matter, Cyanide, Metals, PAH's, Phenols, Asbestos
CBR California Bearing Ratio
* Saturated Moisture Content



APPENDICES



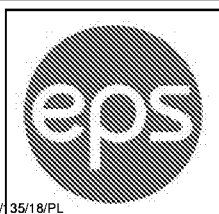
APPENDIX A

Selected Site Photographs



- Approximate Site Boundary
- ① Approximate Photo Location

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Licence Number: 100054115



Title: Photo Location Plan

Project: Saltbox, Shripney Road,
Bognor Regis, PO22 9NW

Appendix: A

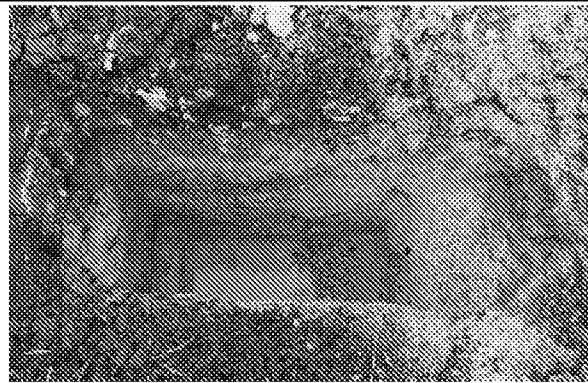
Scale: NTS

Drawn By: SC Approved By: WE

Job No: UK17.2707B

Dwg No: Bognor/1217/A

Date: December 2017

Photo 1: Site entrance along the east boundary facing west	Photo 2: View of the site from the northwest corner facing east
	
Photo 3: BH1 location along the southern edge	Photo 4: TP1 in the south east corner
	
Photo 5: TP5 in the south west corner	Photo 6: TP8 in the north west corner
	



APPENDIX B

Proposed Development Plan

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LIST OF INFORMANTS:

ORDNANCE SURVEY

-

-

-

REVISIONS DATE DRN REV

DEVELOPMENT SCHEDULE:

PHASE 1:

FOODSTORE:	20,000ft² GIA	1858 m² GIA
DRIVE-THRU RESTAURANT:	2,500ft² GIA	232 m² GIA
PUB/RESTAURANT:	4,200ft² GIA	390 m² GIA
TRADE UNITS:	51,500ft² GIA	4784 m² GIA

B1/B8 UNITS 17,500ft² GIA 1626 m² GIA

TOTAL GIA: 95,700ft² GIA 8890 m² GIA

PHASE 2:

B2/B8 UNITS	142,000ft² GIA	13192 m² GIA
-OFFICES	25,000ft² GIA	2323 m² GIA

TOTAL GIA: 167,000ft² GIA 15515 m² GIA

TOTAL GIA (PHASES 1 & 2): 262,700ft² (24,405m²)

TOTAL GEA (PHASES 1 & 2): 270,581ft² (25,137m²)

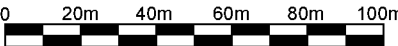
NOTE: THE FIGURES LISTED ABOVE ARE APROXIMATE AND ARE SUBJECT TO DESIGN DEVELOPMENT AND DETAILED SITE INFORMATION. ANY AREAS QUOTED EXCLUDE ANY POTENTIAL MEZZANINE LEVELS.

GEA AREA ABOVE CALCULATED AT TOTAL GIA+3%

KEY:LDO DEVELOPMENT ZONES (AS SHOWN ON TERENCE O'ROURKE DART PLAN 2_ZONING PLAN REF:190402/URB/PP/Zoning/Owner/004)

- ZONE W1
- ZONE W2 - GATEWAY ZONE
- ZONE W3 - VILLAGE BUFFER
- ZONE W4 - LOCAL NATURE RESERVE BUFFER

SALTBOX SITE - BOGNOR REGIS



MountfordPigott

SITE MASTERPLAN
AS PROPOSED
1744-F05

1:2000 @ A3 25.09.15

ORIGIN: SY

08





APPENDIX C

Site Specific Borehole & Trial Pit Logs



EPS Ltd | 7B Caxton House |
Broad Street | Cambourne |
Cambridge | CB23 6JN

Borehole Log

Borehole No.

BH1

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -

Hole Type
CP

Location: Bognor Regis

Level:

Scale
1:105

Client: Kirk Saunders

Dates: -

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60	D		0.60			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots	1
		1.20		N=4 (0.5,0.5/1,1,1,1)					2
		1.20	SPTL S						3
		1.70	D						
		2.00		N=4 (0.5,0.5/1,0,1,2)				4	
		2.00	SPTL S					5	
		2.50	D					6	
		3.00		N=3 (0.5,0.5/0,1,1,1)	4.00			7	
		3.00	SPTL S					8	
		3.50	D					9	
		4.00		N=4 (1,1/1,1,1,1)				10	
		4.00	SPTL S					11	
		4.00 - 4.50	B					12	
		4.50	D					13	
		5.00		N=3 (0.5,0.5/1,0,1,1)				14	
		5.00	SPTL S					15	
		5.50	D					16	
		6.00		N=3 (1,1/0,1,1,1)				17	
		6.00	SPTL S					18	
		6.50	D					19	
		7.50		N=6 (1,1/1,2,2,1)				20	
		7.50	D					21	
		7.50	SPTL S					22	
		8.50	D					23	
		9.00		N=12 (4,4/1,3,4,4)				24	
		9.00	SPTL S					25	
		9.50	D					26	
		10.50		N=11 (2,2/2,3,3,3)				27	
		10.50	D					28	
		10.50	SPTL S					29	
11.50	D				30				
12.00		N=10 (2,1/2,4,2,2)				31			
12.00	SPTL S					32			
12.50	D					33			
13.50		N=8 (0.5,0.5/1,2,1,4)				34			
13.50	D					35			
13.50	SPTL S					36			
14.50	D					37			
15.00		N=22 (1,1/4,5,7,6)				38			
15.00	SPTL S					39			
15.50	D					40			
16.50		N=35 (3,3/6,9,9,11)				41			
16.50	D					42			
16.50 - 17.00	B					43			
17.50	D					44			
18.00		50 (5,5/13,19,18,)				45			
18.00	SPTL S					46			
18.50	D		20.00			47			
19.50		50 (13,12/17,22,11,)				48			
19.50	D					49			
19.50	SPTL S					50			

Remarks

Groundwater encountered at 4.0m rising to 2.0m





EPS Ltd | 7B Caxton House |
Broad Street | Cambourne |
Cambridge | CB23 6JN

Borehole Log

Borehole No.

BH2

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -

Hole Type
CP

Location: Bognor Regis

Level:

Scale
1:105

Client: Kirk Saunders

Dates: -

Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	D		0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots	1
		1.20	U					Soft to firm yellowish brown slightly gravelly sandy silty CLAY with occasional black speckling and light grey mottling. Gravel is fine and medium chalk (River Terrace Deposits)	2
		1.70	D						
		2.00		N=2 (0.5,0.5/1,0,1,0)					
		2.00	SPTL S						
		2.50	D		3.00				3
		3.00		N=12 (1,1/1,3,3,5)					
		3.00	SPTL S						
		3.50	D						4
		4.00		N=27 (4,4/6,6,6,9)					
		4.00	SPTL S						5
		4.50	D						
		5.00		N=26 (5,6/6,6,7,7)					6
		5.00	SPTL S						
		5.50	D						7
		6.00		N=18 (2,2/3,6,4,5)					
		6.00	SPTL S						
		6.50	D						8
		7.50		N=11 (1,1/1,2,3,5)					
		7.50	D						9
		7.50	SPTL S						
		7.50 - 8.00	B						
		8.50	D						10
		9.00		N=11 (1,1/2,2,3,4)					
		9.00	SPTL S						
		9.50	D						11
		10.50		N=24 (2,3/6,5,6,7)					
		10.50	D						12
		10.50	SPTL S						
		11.50	D						
		12.00		N=8 (3,4/3,2,2,1)					13
		12.00	SPTL S						
		12.50	D						14
		13.50		N=12 (6,6/3,3,3,3)					
		13.50	D						15
		13.50	SPTL S						
		14.50	D						16
		15.00		N=15 (1,2/3,4,4,4)					
		15.00	SPTL S						
		15.50	D						17
		16.50		N=12 (1,1/1,3,2,6)					
		16.50	D						18
		16.50	SPTL S						
		17.50	D						19
		18.00		N=24 (5,6/10,5,4,5)					
		18.00	SPTL S						
		18.50	D		20.00				20
		19.50		N=13 (1,2/2,3,4,4)					
		19.50	D						21
		19.50	SPTL S						

Remarks

Groundwater encountered at 4.0m rising to 2.9m





EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Trial Pit Log

Trialpit No

TP01

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions (m):

1.5

Depth
2.00

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.40 0.10 - 0.80	ES B		0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
	0.60 - 0.80	D		1.00			Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)
	1.80 - 2.00	D		2.00			Soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY. Gravel is fine to coarse chalk and flint (River Terrace Deposits)
							End of pit at 2.00 m

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating



1

2



EPS Ltd | 7B Caxton House | Broad
Street | Cambourne | Cambridge |
CB23 6JN

Trial Pit Log

Trialpit No

TP02

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions
(m):

1.5

Depth
2.00

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.30	ES		0.30			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
				0.70			Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)
	1.80 - 2.00	D		2.00			Soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY. Gravel is fine to coarse chalk and flint. (River Terrace Deposits)
							End of pit at 2.00 m

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating





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Street | Cambourne | Cambridge |
CB23 6JN

Trial Pit Log

Trialpit No

TP03

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions
(m):

1.5

Depth
2.00

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.40	ES		0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
							Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)
				1.80			
				2.00			Soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY. Gravel is fine to coarse chalk and flint. (River Terrace Deposits)
							End of pit at 2.00 m

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating



1

2



EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Trial Pit Log

Trialpit No

TP04

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions (m):

1.5

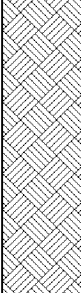
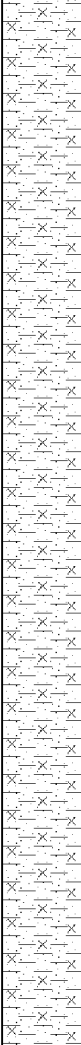
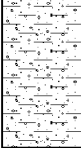
Depth
2.00

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10 - 0.40	ES		0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots	
							Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)	
				1.80			Soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY. Gravel is fine to coarse chalk and flint. (River Terrace Deposits)	
				2.00			End of pit at 2.00 m	

1

2

Remarks: Groundwater encountered at 1.8m

Stability: Stable sides whilst excavating





EPS Ltd | 7B Caxton House | Broad
Street | Cambourne | Cambridge |
CB23 6JN

Trial Pit Log

Trialpit No

TP05

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions
(m):

1.5

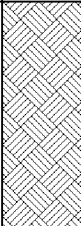
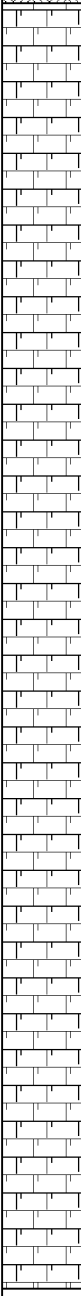
Depth
2.00

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.30 0.10 - 0.80	ES B		0.30			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
							Structureless CHALK in a soft to firm white slightly clayey gravelly sandy silty matrix with occasional large subangular to subrounded flint and gravel fragments (Lewes Nodular Chalk Formation Grade Dm)
	1.80 - 2.00	D		2.00			End of pit at 2.00 m

Remarks: Groundwater encountered at 1.8m

Stability: Stable sides whilst excavating





EPS Ltd | 7B Caxton House | Broad Street | Cambourne | Cambridge | CB23 6JN

Trial Pit Log

Trialpit No

TP06

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions (m):

1.5

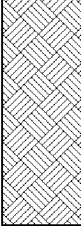
Depth
1.50

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.30	ES		0.30			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
	1.30 - 1.50	D		1.50			Structureless CHALK in a soft to firm white slightly clayey gravelly sandy silty matrix with occasional large subangular to subrounded flint and gravel fragments (Lewes Nodular Chalk Formation Grade Dm)
							End of pit at 1.50 m

1

2

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating





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Trial Pit Log

Trialpit No

TP07

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions (m):

1.5

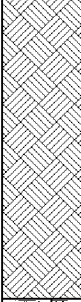
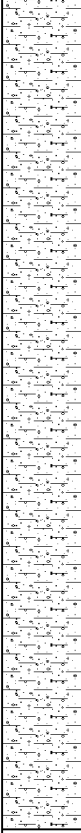
Depth
1.50

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.40	ES		0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
							Soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY. Gravel is fine to coarse chalk and flint. (River Terrace Deposits)
	1.30 - 1.50	D		1.50			
							End of pit at 1.50 m

1

2

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating





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Trial Pit Log

Trialpit No

TP08

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions (m):

1.5

Depth
1.00

0.5

Scale

1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.50 0.10 - 0.80	ES B		0.50			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
	0.80 - 1.00	D		1.00			Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)
							End of pit at 1.00 m

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating





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Street | Cambourne | Cambridge |
CB23 6JN

Trial Pit Log

Trialpit No

TP09

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions
(m):

1.5

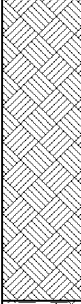
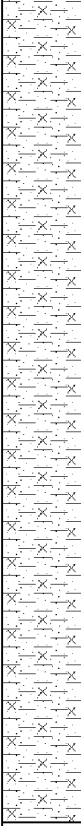
Depth
1.50

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
				1.50			Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)
							End of pit at 1.50 m

1

2

Remarks: Groundwater not encountered

Stability: Stable sides whilst excavating





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Trial Pit Log

Trialpit No

TP10

Sheet 1 of 1

Project Name: Saltbox

Project No.
UK17.2707B

Co-ords: -
Level:

Date

Location: Bognor Regis

Dimensions (m):

1.5

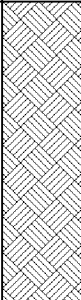
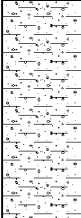
Depth
1.00

0.5

Scale
1:10

Logged

Client: Kirk Saunders

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.40			TOPSOIL: Soft yellowish dark brown silty clayey material with rare fine and medium flint gravel and recently active roots
				0.70			Soft to firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel (River Terrace Deposits)
				1.00			Soft mottled light grey and pale olive slightly gravelly sandy chalky CLAY. Gravel is fine to coarse chalk and flint. (River Terrace Deposits)
							End of pit at 1.00 m

1

2

Remarks: Groundwater not encountered

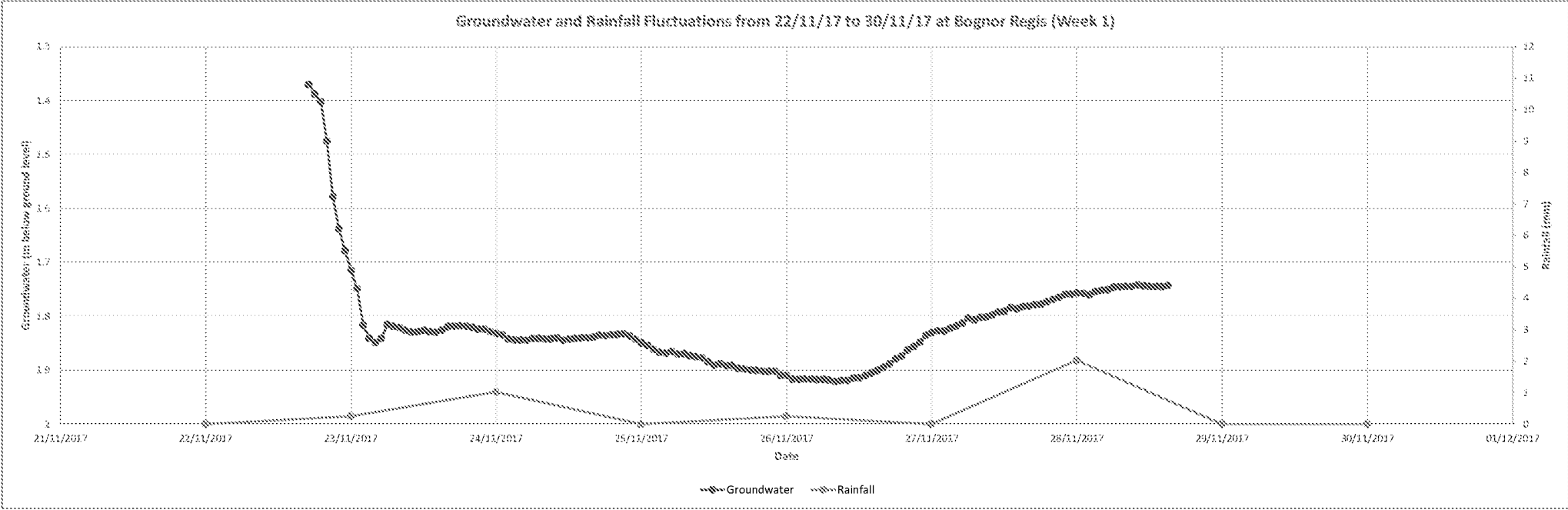
Stability: Stable sides whilst excavating

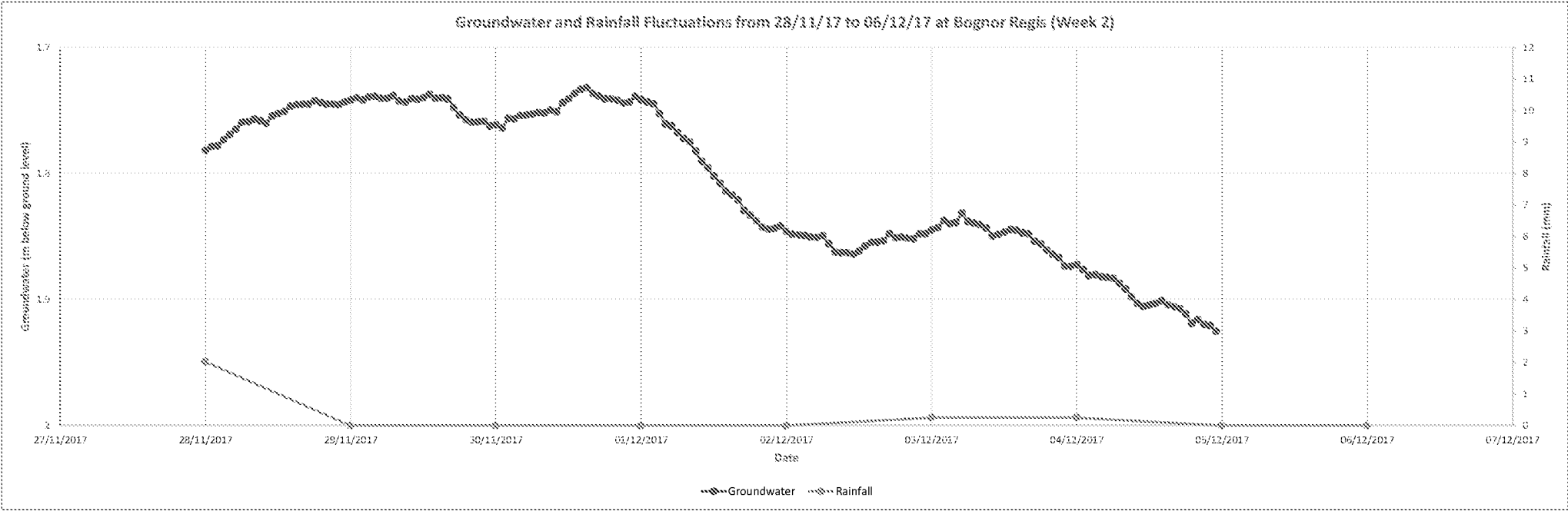


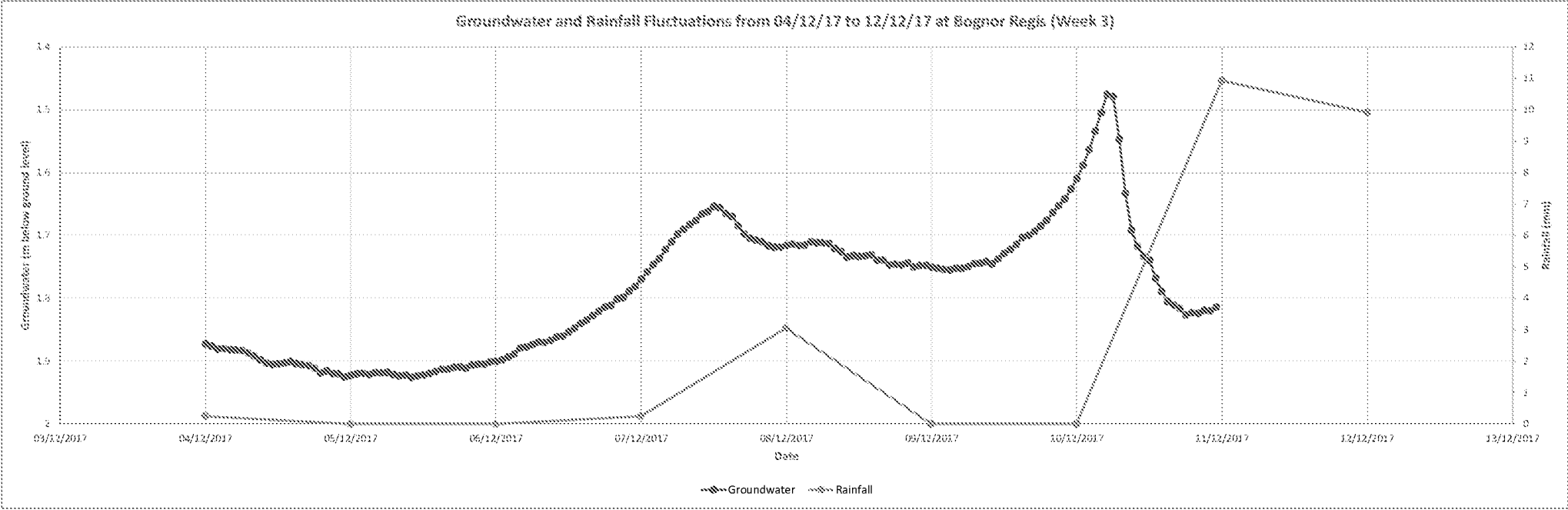


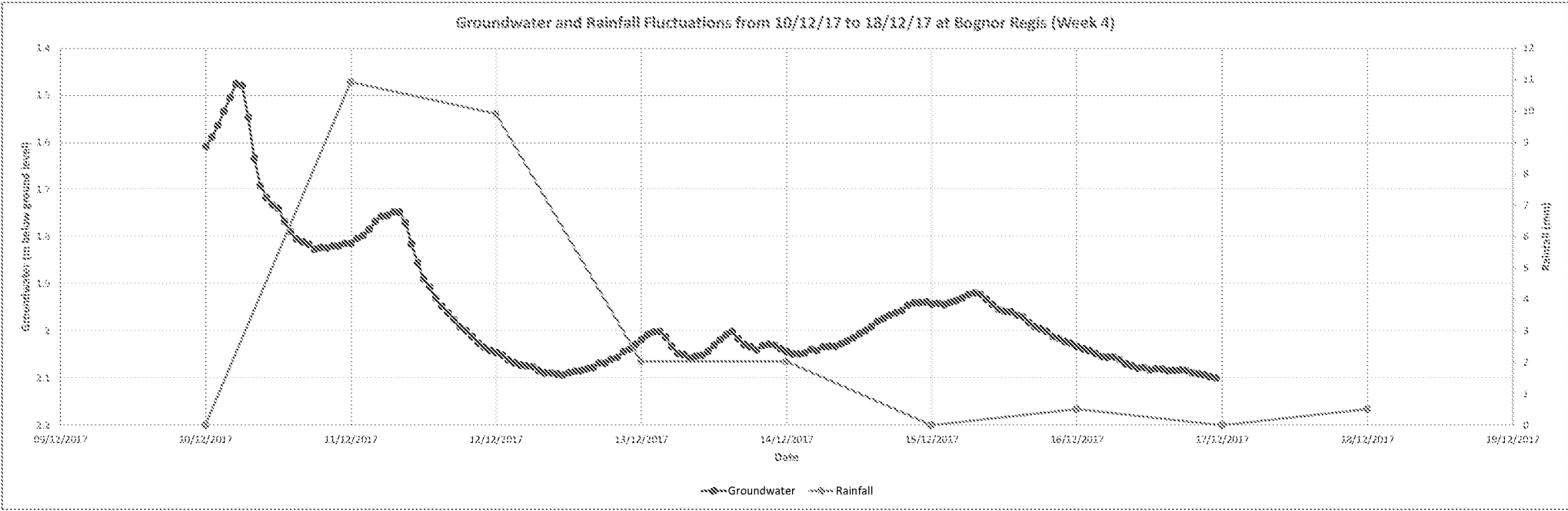
APPENDIX D

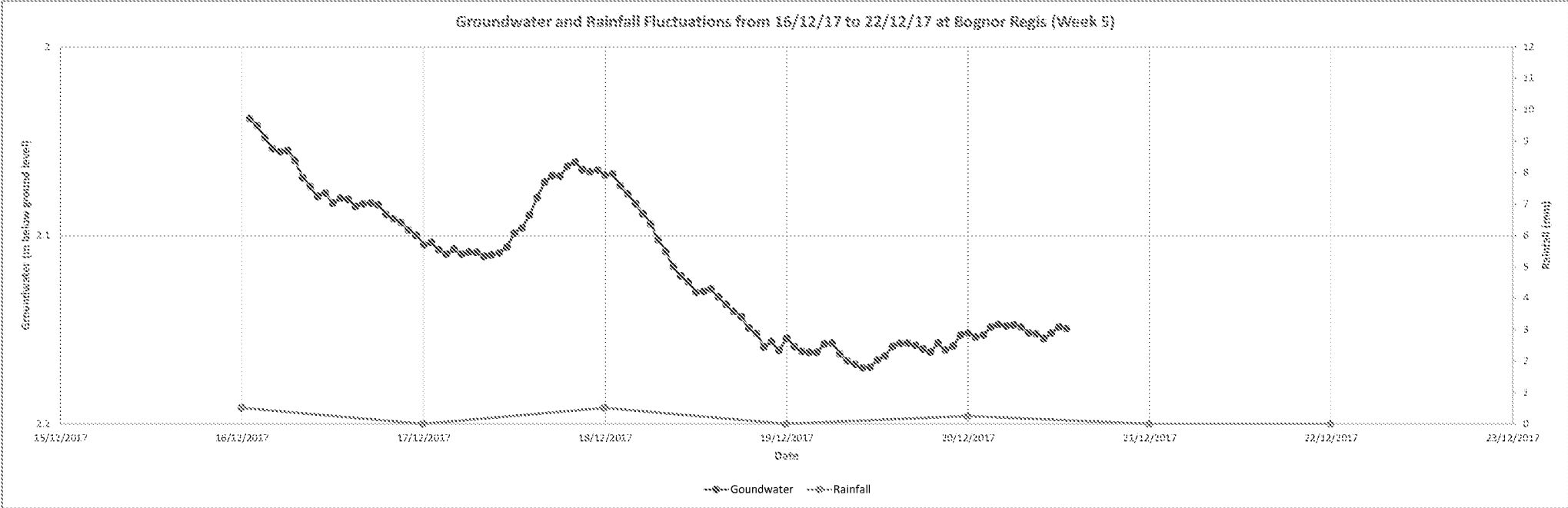
Groundwater & Rainfall Fluctuation Graphs













APPENDIX E

Laboratory Results – Environmental

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill
JE Job No.: 17/19637

Report : Solid

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

J E Sample No.	10	11	12										
Sample ID	TP4	TP6	TP5										
Depth	0.00-0.40	0.00-0.30	0.00-0.50										
COC No / misc													
Containers	J	J	J										
Sample Date	21/11/2017	21/11/2017	21/11/2017										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	29/11/2017	29/11/2017	29/11/2017										
											LOD/LOR	Units	Method No.
Arsenic ^{#M}	7.0	9.9	8.4								<0.5	mg/kg	TM30/PM15
Cadmium ^{#M}	0.3	0.3	0.2								<0.1	mg/kg	TM30/PM15
Chromium ^{#M}	34.8	37.4	41.4								<0.5	mg/kg	TM30/PM15
Copper ^{#M}	9	6	4								<1	mg/kg	TM30/PM15
Lead ^{#M}	16	11	11								<5	mg/kg	TM30/PM15
Mercury ^{#M}	<0.1	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel ^{#M}	12.5	15.6	15.9								<0.7	mg/kg	TM30/PM15
Selenium ^{#M}	<1	<1	<1								<1	mg/kg	TM30/PM15
Total Sulphate as SO4 ^{#M}	345	326	342								<50	mg/kg	TM50/PM29
Zinc ^{#M}	57	44	40								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene ^{#M}	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene ^{#M}	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene ^{#M}	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene ^{#M}	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene ^{#M}	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene [#]	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	<0.06	<0.06	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene ^{#M}	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene ^{#M}	<0.07	<0.07	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene ^{#M}	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6								<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	104	101								<0	%	TM4/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15								<0.15	mg/kg	TM26/PM21
Natural Moisture Content	19.6	17.7	18.9								<0.1	%	PM4/PM0
Hexavalent Chromium [#]	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) ^{#M}	<0.0015	<0.0015	<0.0015								<0.0015	g/l	TM38/PM20
Chromium III	34.8	37.4	41.4								<0.5	mg/kg	NONE/NONE
Total Cyanide ^{#M}	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
Organic Matter	0.8	1.0	1.0								<0.2	%	TM21/PM24

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill
JE Job No.: 17/19637

Report : Solid

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

J E Sample No.	10	11	12
Sample ID	TP4	TP6	TP5
Depth	0.00-0.40	0.00-0.30	0.00-0.50
COC No / misc			
Containers	J	J	J
Sample Date	21/11/2017	21/11/2017	21/11/2017
Sample Type	Soil	Soil	Soil
Batch Number	1	1	1
Date of Receipt	29/11/2017	29/11/2017	29/11/2017
pH #M	7.62	8.05	7.90
Sample Type	Clay	Clay	Clay
Sample Colour	Medium Brown	Medium Brown	Medium Brown
Other Items	stones	stones, roots	stones, roots

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:



Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/19637	1	TP4	0.00-0.40	10	30/11/2017	General Description (Bulk Analysis)	Soil/Stones
					30/11/2017	Asbestos Fibres	NAD
					30/11/2017	Asbestos Fibres (2)	NAD
					30/11/2017	Asbestos ACM	NAD
					30/11/2017	Asbestos ACM (2)	NAD
					30/11/2017	Asbestos Type	NAD
					30/11/2017	Asbestos Type (2)	NAD
					30/11/2017	Asbestos Level Screen	NAD
17/19637	1	TP6	0.00-0.30	11	30/11/2017	General Description (Bulk Analysis)	Soil/Stones
					30/11/2017	Asbestos Fibres	NAD
					30/11/2017	Asbestos Fibres (2)	NAD
					30/11/2017	Asbestos ACM	NAD
					30/11/2017	Asbestos ACM (2)	NAD
					30/11/2017	Asbestos Type	NAD
					30/11/2017	Asbestos Type (2)	NAD
					30/11/2017	Asbestos Level Screen	NAD
17/19637	1	TP5	0.00-0.50	12	30/11/2017	General Description (Bulk Analysis)	Soil/Stones
					30/11/2017	Asbestos Fibres	NAD
					30/11/2017	Asbestos Fibres (2)	NAD
					30/11/2017	Asbestos ACM	NAD
					30/11/2017	Asbestos ACM (2)	NAD
					30/11/2017	Asbestos Type	NAD
					30/11/2017	Asbestos Type (2)	NAD
					30/11/2017	Asbestos Level Screen	NAD

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/19637

SOILS

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

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

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

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

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

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

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

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

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

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

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

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/19637

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes	Yes	AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

JE Job No: 17/19637

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes	Yes	AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes	Yes	AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill
JE Job No.: 17/19637

Report : Solid

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

J E Sample No.	1-3	4-6	7-9										
Sample ID	TP1	TP1	TP5										
Depth	0.00-0.40	0.40-1.00	1.00-2.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	21/11/2017	21/11/2017	21/11/2017										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	29/11/2017	29/11/2017	29/11/2017										
											Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Arsenic ^{#M}	8.6	11.5	5.0								<0.5	mg/kg	TM30/PM15
Cadmium ^{#M}	0.3	<0.1	0.8								<0.1	mg/kg	TM30/PM15
Chromium ^{#M}	51.2	61.4	6.2								<0.5	mg/kg	TM30/PM15
Copper ^{#M}	9	13	4								<1	mg/kg	TM30/PM15
Lead ^{#M}	15	10	<5								<5	mg/kg	TM30/PM15
Mercury ^{#M}	<0.1	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel ^{#M}	17.2	34.4	7.3								<0.7	mg/kg	TM30/PM15
Selenium ^{#M}	1	<1	<1								<1	mg/kg	TM30/PM15
Zinc ^{#M}	50	61	26								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene ^{#M}	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene ^{#M}	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene ^{#M}	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene ^{#M}	0.05	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene ^{#M}	0.10	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene [#]	0.09	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	0.09	<0.06	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene ^{#M}	0.06	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene ^{#M}	<0.07	<0.07	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene ^{#M}	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6								<0.6	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64								<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	104	99	103								<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30								<30	mg/kg	TM5/PM16

Please include all sections of this report if it is reproduced

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg) =		-	Moisture Content Ratio (%) =		20.4		
Mass of dry sample (kg) =		0.09	Dry Matter Content Ratio (%) =		83.0		
Particle Size <4mm =		>95%					
JEFL Job No		17/19637			Landfill Waste Acceptance Criteria Limits		
Sample No		3					
Client Sample No		TP1			Inert Waste Landfill Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill Hazardous Waste Landfill		
Depth/Other		0.00-0.40					
Sample Date		21/11/2017					
Batch No		1					
Solid Waste Analysis							
Total Organic Carbon (%)		0.51	3				
Loss on Ignition (%)		4.5	5				
Sum of BTEX (mg/kg)		<0.025	6				
Sum of 7 PCBs (mg/kg)		<0.035	1				
Mineral Oil (mg/kg)		<30	500				
PAH Sum of 17(mg/kg)		<0.64	100				
pH (pH Units)		7.30	>6				
ANC to pH 7 (mol/kg)		-	-				
ANC to pH 4 (mol/kg)		-	-				
Eluate Analysis		10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg			
		C ₁₀	A ₁₀				
		mg/l	mg/kg				
Arsenic	<0.0025	<0.025	0.5			2	25
Barium	0.003	0.03	20			100	300
Cadmium	<0.0005	<0.005	0.04			1	5
Chromium	<0.0015	<0.015	0.5			10	70
Copper	<0.007	<0.07	2			50	100
Mercury	<0.001	<0.01	0.01			0.2	2
Molybdenum	<0.002	<0.02	0.5			10	30
Nickel	<0.002	<0.02	0.4			10	40
Lead	<0.005	<0.05	0.5			10	50
Antimony	<0.002	<0.02	0.06			0.7	5
Selenium	<0.003	<0.03	0.1			0.5	7
Zinc	0.003	0.03	4			50	200
Chloride	0.4	4	800			15000	25000
Fluoride	0.9	9	10			150	500
Sulphate as SO4	0.83	8.3	1000			20000	50000
Total Dissolved Solids	130	1301	4000			60000	100000
Phenol	<0.01	<0.1	1			-	-
Dissolved Organic Carbon	9	90	500			800	1000

Mass of sample taken (kg) =		-	Moisture Content Ratio (%) =		22.0		
Mass of dry sample (kg) =		0.09	Dry Matter Content Ratio (%) =		82.0		
Particle Size <4mm =		>95%					
JEFL Job No		17/19637			Landfill Waste Acceptance Criteria Limits		
Sample No		6					
Client Sample No		TP1			Inert Waste Landfill Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill Hazardous Waste Landfill		
Depth/Other		0.40-1.00					
Sample Date		21/11/2017					
Batch No		1					
Solid Waste Analysis							
Total Organic Carbon (%)		0.22	3				
Loss on Ignition (%)		4.5	5				
Sum of BTEX (mg/kg)		<0.025	6				
Sum of 7 PCBs (mg/kg)		<0.035	1				
Mineral Oil (mg/kg)		<30	500				
PAH Sum of 17(mg/kg)		<0.64	100				
pH (pH Units)		7.51	>6				
ANC to pH 7 (mol/kg)		-	-				
ANC to pH 4 (mol/kg)		-	-				
Eluate Analysis		10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg			
		C ₁₀	A ₁₀				
		mg/l	mg/kg				
Arsenic	<0.0025	<0.025	0.5				
Barium	<0.003	<0.03	2				
Cadmium	<0.0005	<0.005	1				
Chromium	<0.0015	<0.015	10				
Copper	<0.007	<0.07	2				
Mercury	<0.001	<0.01	50				
Molybdenum	<0.002	<0.02	0.01				
Nickel	<0.002	<0.02	0.2				
Lead	<0.005	<0.05	0.5				
Antimony	<0.002	<0.02	10				
Selenium	<0.003	<0.03	0.06				
Zinc	<0.003	<0.03	0.7				
Chloride	<0.3	<3	0.1				
Fluoride	<0.3	<3	5				
Sulphate as SO4	1.77	17.7	7				
Total Dissolved Solids	540	5399	70				
Phenol	<0.01	<0.1	500				
Dissolved Organic Carbon	7	70	800				
			1000				

Mass of sample taken (kg) =		-	Moisture Content Ratio (%) =		24.9		
Mass of dry sample (kg) =		0.09	Dry Matter Content Ratio (%) =		80.1		
Particle Size <4mm =		>95%					
JEFL Job No		17/19637			Landfill Waste Acceptance Criteria Limits		
Sample No		9					
Client Sample No		TP5			Inert Waste Landfill Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill Hazardous Waste Landfill		
Depth/Other		1.00-2.00					
Sample Date		21/11/2017					
Batch No		1					
Solid Waste Analysis							
Total Organic Carbon (%)		0.05		3	5	6	
Loss on Ignition (%)		<1.0		-	-	10	
Sum of BTEX (mg/kg)		<0.025		6	-	-	
Sum of 7 PCBs (mg/kg)		<0.035		1	-	-	
Mineral Oil (mg/kg)		<30		500	-	-	
PAH Sum of 17(mg/kg)		<0.64		100	-	-	
pH (pH Units)		8.12		-	>6	-	
ANC to pH 7 (mol/kg)		-		-	to be evaluated	to be evaluated	
ANC to pH 4 (mol/kg)		-		-	to be evaluated	to be evaluated	
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg				
	C ₁₀	A ₁₀					
	mg/l	mg/kg					
	mg/kg						
Arsenic	<0.0025	<0.025	0.5	2	25		
Barium	<0.003	<0.03	20	100	300		
Cadmium	<0.0005	<0.005	0.04	1	5		
Chromium	<0.0015	<0.015	0.5	10	70		
Copper	<0.007	<0.07	2	50	100		
Mercury	<0.001	<0.01	0.01	0.2	2		
Molybdenum	<0.002	<0.02	0.5	10	30		
Nickel	<0.002	<0.02	0.4	10	40		
Lead	<0.005	<0.05	0.5	10	50		
Antimony	<0.002	<0.02	0.06	0.7	5		
Selenium	<0.003	<0.03	0.1	0.5	7		
Zinc	<0.003	<0.03	4	50	200		
Chloride	0.7	7	800	15000	25000		
Fluoride	0.3	3	10	150	500		
Sulphate as SO4	2.96	29.6	1000	20000	50000		
Total Dissolved Solids	174	1741	4000	60000	100000		
Phenol	<0.01	<0.1	1	-	-		
Dissolved Organic Carbon	<2	<20	500	800	1000		

Matrix : Solid

[illegible]

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/19637	1	TP1	0.00-0.40	2	30/11/2017	General Description (Bulk Analysis)	Soil/Stone
					30/11/2017	Asbestos Fibres	NAD
					30/11/2017	Asbestos Fibres (2)	NAD
					30/11/2017	Asbestos ACM	NAD
					30/11/2017	Asbestos ACM (2)	NAD
					30/11/2017	Asbestos Type	NAD
					30/11/2017	Asbestos Type (2)	NAD
					30/11/2017	Asbestos Level Screen	NAD
17/19637	1	TP1	0.40-1.00	5	30/11/2017	General Description (Bulk Analysis)	Soil/Stone
					30/11/2017	Asbestos Fibres	NAD
					30/11/2017	Asbestos Fibres (2)	NAD
					30/11/2017	Asbestos ACM	NAD
					30/11/2017	Asbestos ACM (2)	NAD
					30/11/2017	Asbestos Type	NAD
					30/11/2017	Asbestos Type (2)	NAD
					30/11/2017	Asbestos Level Screen	NAD
17/19637	1	TP5	1.00-2.00	8	30/11/2017	General Description (Bulk Analysis)	Soil/Stone
					30/11/2017	Asbestos Fibres	NAD
					30/11/2017	Asbestos Fibres (2)	NAD
					30/11/2017	Asbestos ACM	NAD
					30/11/2017	Asbestos ACM (2)	NAD
					30/11/2017	Asbestos Type	NAD
					30/11/2017	Asbestos Type (2)	NAD
					30/11/2017	Asbestos Level Screen	NAD

Client Name: EPS Ltd
Reference: UK17.2707
Location: Bognor Regis
Contact: Shaun Cahill

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/19637

SOILS

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

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

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

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

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

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

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

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

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

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

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

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

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

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

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/19637

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes

JE Job No: 17/19637

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified USEPA 160.4. Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (450°C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 17/19637

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes

JE Job No: 17/19637

[illegible]



APPENDIX F

Waste Classification Report



Waste Classification Report



DNX5J-7376K-6LDR7

Job name

Bognor Regis

Description/Comments**Project**

UK17.2707

Site**Waste Stream Template**

EPS Waste Stream

Classified by

Name:

Michael Judson

Date:

20/12/2017 14:22:33 UTC

Telephone:

01954 710666

Company:

EPS**Unit 7B, Caxton House****Broad Street, Great Cambourne****Cambridge****CB23 6JN****Report**

Created by: Michael Judson

Created date: 20/12/2017 14:22 UTC

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP4	0.00-0.40	Non Hazardous		2
2	TP6	0.00-0.30	Non Hazardous		4
3	TP5	0.00-0.50	Non Hazardous		6
4	TP1	0.00-0.40	Non Hazardous		8
5	TP1[1]	0.40-1.00	Non Hazardous		10
6	TP5[1]	1.00-2.00	Non Hazardous		12

Appendices

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Appendix A: Classifier defined and non CLP determinands	14
Appendix B: Rationale for selection of metal species	16
Appendix C: Version	16



Classification of sample: TP4

Non Hazardous Waste
Classified as 17 05 04
in the List of Waste

Sample details

Sample Name: TP4 LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.00-0.40 m Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 19.6%
(dry weight correction) Entry:

Hazard properties

None identified

Determinands

Moisture content: 19.6% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic pentoxide }			1	7	mg/kg	1.534	8.978	mg/kg	0.000898 %	✓	
		033-004-00-6	215-118-9	1303-28-2									
2		cadmium { * cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.3	mg/kg		0.251	mg/kg	0.0000251 %	✓	
		043-001-00-5											
3		chromium in chromium(III) compounds { * chromium(III) oxide }				34.8	mg/kg	1.462	42.527	mg/kg	0.00425 %	✓	
			215-166-8	1393-38-9									
4		copper { * dicopper oxide; copper (I) oxide }				9	mg/kg	1.126	8.472	mg/kg	0.000847 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
5		lead { * lead compounds with the exception of those specified elsewhere in this Annex }			1	16	mg/kg		13.378	mg/kg	0.00134 %	✓	
		082-001-00-6											
6		mercury { mercury }				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		050-001-00-0	231-106-7	7439-97-6									
7		nickel { nickel }			7	12.5	mg/kg		10.452	mg/kg	0.00105 %	✓	
		028-002-00-7	231-111-4	7440-02-0									
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
		034-002-00-8											
9		zinc { zinc oxide }				57	mg/kg	1.245	59.322	mg/kg	0.00593 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
10		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		001-052-00-2	202-049-5	91-20-3									
11	*	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	206-96-3									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
12	* acenaphthene	201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
13	* fluorene	201-685-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
14	* phenanthrene	201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
15	* anthracene	204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
16	* fluoranthene	205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
17	* pyrene	204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %			<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %			<LOD
19	chrysene	601-048-00-0	205-923-4		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
21	* indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
23	* benzo[ghi]perylene	205-863-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
26	☞ chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-6		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %			<LOD
27	* pH		pH		7.62 pH		7.62 pH	7.62 pH			
Total:									0.0147 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- ☞ Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: TP6

Non Hazardous Waste
Classified as 17 05 04
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP6	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
17.7%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 17.7% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic pentoxide }				9.9	mg/kg	1.534	12.902	mg/kg	0.00129 %	✓	
	033-004-00-6	215-118-9	1303-28-2									
2	cadmium { * cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.3	mg/kg		0.255	mg/kg	0.0000255 %	✓	
	043-001-00-5											
3	chromium in chromium(III) compounds { * chromium(III) oxide }				37.4	mg/kg	1.462	46.442	mg/kg	0.00464 %	✓	
		215-166-8	1393-38-9									
4	copper { * dicopper oxide; copper (I) oxide }				6	mg/kg	1.126	5.739	mg/kg	0.000574 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { * lead compounds with the exception of those specified elsewhere in this Annex }			1	11	mg/kg		9.346	mg/kg	0.000935 %	✓	
	082-001-00-6											
6	mercury { mercury }				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	050-001-00-0	231-106-7	7439-97-6									
7	nickel { nickel }			7	15.6	mg/kg		13.254	mg/kg	0.00133 %	✓	
	028-002-00-7	231-111-4	7440-02-0									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	034-002-00-8											
9	zinc { zinc oxide }				44	mg/kg	1.245	46.531	mg/kg	0.00465 %	✓	
	030-013-00-7	215-222-6	1314-13-2									
10	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	001-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-3									



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
12	* acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	* fluorene	201-685-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
14	* phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
15	* anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
16	* fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
17	* pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	* indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	* benzo[ghi]perylene	205-563-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
26	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-6		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
27	* pH		pH		8.05	pH		8.05	pH	8.05 pH		
Total:										0.0138 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: TP5

Non Hazardous Waste
Classified as 17 05 04
in the List of Waste

Sample details

Sample Name: TP5 LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.00-0.50 m Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 18.9%
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 18.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic pentoxide }	033-004-00-6	215-118-9	1303-28-2	8.4	mg/kg	1.534	10.836	mg/kg	0.00108 %	✓	
2	cadmium { * cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	043-001-00-5			0.2	mg/kg		0.168	mg/kg	0.0000168 %	✓	
3	chromium in chromium(III) compounds { * chromium(III) oxide }	215-166-8	1393-38-9		41.4	mg/kg	1.462	50.89	mg/kg	0.00509 %	✓	
4	copper { * dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	4	mg/kg	1.126	3.788	mg/kg	0.000379 %	✓	
5	lead { * lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			11	mg/kg		9.251	mg/kg	0.000925 %	✓	
6	mercury { mercury }	050-001-00-0	231-106-7	7439-97-6	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
7	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	15.9	mg/kg		13.373	mg/kg	0.00134 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
9	zinc { zinc oxide }	030-013-00-7	215-222-6	1314-13-2	40	mg/kg	1.245	41.874	mg/kg	0.00419 %	✓	
10	naphthalene	001-052-00-2	202-049-5	91-20-3	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
11	acenaphthylene		205-917-1	206-96-3	<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
12	* acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	* fluorene	201-685-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
14	* phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
15	* anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
16	* fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
17	* pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	* indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	* benzo[ghi]perylene	205-863-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
26	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-6		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
27	* pH		pH		7.9	pH		7.9	pH	7.9 pH		
Total:										0.0134 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: TP1

Non Hazardous Waste
Classified as 17 05 04
in the List of Waste

Sample details

Sample Name: TP1 LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 0.00-0.40 m Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 19.9%
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 19.9% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic pentoxide }				8.6	mg/kg	1.534	11.002	mg/kg	0.0011 %	✓	
	033-004-00-6	215-118-9	1303-28-2									
2	cadmium { * cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.3	mg/kg		0.25	mg/kg	0.000025 %	✓	
	043-001-00-5											
3	chromium in chromium(III) compounds { * chromium(III) oxide }				51.2	mg/kg	1.462	62.412	mg/kg	0.00624 %	✓	
		215-166-8	1393-38-9									
4	copper { * dicopper oxide; copper (I) oxide }				9	mg/kg	1.126	8.451	mg/kg	0.000845 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { * lead compounds with the exception of those specified elsewhere in this Annex }			1	15	mg/kg		12.51	mg/kg	0.00125 %	✓	
	082-001-00-6											
6	mercury { mercury }				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	050-001-00-0	231-106-7	7439-97-6									
7	nickel { nickel }			7	17.2	mg/kg		14.345	mg/kg	0.00143 %	✓	
	028-002-00-7	231-111-4	7440-02-0									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1	mg/kg	2.554	2.13	mg/kg	0.000213 %	✓	
	034-002-00-8											
9	zinc { zinc oxide }				50	mg/kg	1.245	51.906	mg/kg	0.00519 %	✓	
	030-013-00-7	215-222-6	1314-13-2									
10	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	001-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-3									



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
12	* acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	* fluorene	201-685-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
14	* phenanthrene	201-581-5	85-01-8		0.05	mg/kg		0.0417	mg/kg	0.00000417 %	✓	
15	* anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
16	* fluoranthene	205-912-4	206-44-0		0.1	mg/kg		0.0834	mg/kg	0.00000834 %	✓	
17	* pyrene	204-927-3	129-00-0		0.09	mg/kg		0.0751	mg/kg	0.00000751 %	✓	
18	benzo[a]anthracene	601-033-00-8	200-280-6		0.09	mg/kg		0.0751	mg/kg	0.00000751 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.06	mg/kg		0.05	mg/kg	0.000005 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	* indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	* benzo[ghi]perylene	205-863-8	161-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	* coronene	205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
27	* TPH (C6 to C40) petroleum group		TPH		<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
28	* polychlorobiphenyls; PCB	602-039-00-4	215-648-1		<35	mg/kg		<35	mg/kg	<0.0035 %		<LOD
29	benzene	601-020-00-8	200-753-7		<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
30	toluene	601-021-00-3	203-625-9		<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
31	* ethylbenzene	601-023-00-4	202-849-4		<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-398-5 [2] 203-576-3 [3] 215-535-7 [4]		<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
33	* chromium in chromium(VI) compounds { chromium(VI) oxide }	624-001-00-0	215-607-8		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
34	* pH		pH		7.3	pH		7.3	pH	7.3 pH		
Total:										0.0257 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: TP1[1]

Non Hazardous Waste
Classified as 17 05 04
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP1[1]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.40-1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19.6%	
(dry weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 19.6% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic pentoxide }				11.5	mg/kg	1.534	14.749	mg/kg	0.00147 %	✓	
	033-004-00-6	215-118-9	1303-28-2									
2	cadmium { * cadmium compounds, with the exception of cadmium sulposelenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	043-001-00-5											
3	chromium in chromium(III) compounds { * chromium(III) oxide }				61.4	mg/kg	1.462	75.033	mg/kg	0.0075 %	✓	
		215-166-8	1393-38-9									
4	copper { * dicopper oxide; copper (I) oxide }				13	mg/kg	1.126	12.238	mg/kg	0.00122 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5	lead { * lead compounds with the exception of those specified elsewhere in this Annex }			1	10	mg/kg		8.361	mg/kg	0.000836 %	✓	
	082-001-00-6											
6	mercury { mercury }				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	050-001-00-0	231-106-7	7439-97-6									
7	nickel { nickel }			7	34.4	mg/kg		28.763	mg/kg	0.00288 %	✓	
	028-002-00-7	231-111-4	7440-02-0									
8	selenium { selenium compounds with the exception of cadmium sulposelenide and those specified elsewhere in this Annex }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	034-002-00-8											
9	zinc { zinc oxide }				61	mg/kg	1.245	63.485	mg/kg	0.00635 %	✓	
	030-013-00-7	215-222-6	1314-13-2									
10	naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	001-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	206-96-3									



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
12	* acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	* fluorene	201-685-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
14	* phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
15	* anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
16	* fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
17	* pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-8	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	* indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	* benzo[ghi]perylene	205-863-8	161-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	* coronene	205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
27	* TPH (C6 to C40) petroleum group		TPH		<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
28	* polychlorobiphenyls; PCB	602-039-00-4	215-648-1		<35	mg/kg		<35	mg/kg	<0.0035 %		<LOD
29	benzene	601-020-00-8	200-753-7		<0	mg/kg		<0	mg/kg	<0%		<LOD
30	toluene	601-021-00-3	203-625-9		<0	mg/kg		<0	mg/kg	<0%		<LOD
31	* ethylbenzene	601-023-00-4	202-849-4		<0	mg/kg		<0	mg/kg	<0%		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-398-5 [2] 203-576-3 [3] 215-535-7 [4]		<0	mg/kg		<0	mg/kg	<0%		<LOD
33	* chromium in chromium(VI) compounds { chromium(VI) oxide }	624-061-00-0	215-607-8		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
34	* pH		pH		7.51	pH		7.51	pH	7.51 pH		
Total:										0.028 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: TP5[1]

Non Hazardous Waste
Classified as 17 05 04
in the List of Waste

Sample details

Sample Name: TP5[1] LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: 1.00-2.00 m Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content: 24.9%
(dry weight correction)

Hazard properties

None identified

Determinands

Moisture content: 24.9% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		arsenic { arsenic pentoxide }			1	5	mg/kg	1.534	6.14	mg/kg	0.000614 %	✓	
		033-004-00-6	215-118-9	1303-28-2									
2		cadmium { * cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }				0.8	mg/kg		0.641	mg/kg	0.0000641 %	✓	
		043-001-00-5											
3		chromium in chromium(III) compounds { * chromium(III) oxide }				6.2	mg/kg	1.462	7.255	mg/kg	0.000726 %	✓	
			215-166-8	1393-38-9									
4		copper { * dicopper oxide; copper (I) oxide }				4	mg/kg	1.126	3.606	mg/kg	0.000361 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
5		lead { * lead compounds with the exception of those specified elsewhere in this Annex }			1	<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		082-001-00-6											
6		mercury { mercury }				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		050-001-00-0	231-106-7	7439-97-6									
7		nickel { nickel }			7	7.3	mg/kg		5.845	mg/kg	0.000584 %	✓	
		028-002-00-7	231-111-4	7440-02-0									
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
		034-002-00-8											
9		zinc { zinc oxide }				26	mg/kg	1.245	25.911	mg/kg	0.00259 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
10		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		001-052-00-2	202-049-5	91-20-3									
11	*	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	206-96-3									



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
12	* acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	* fluorene	201-685-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
14	* phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
15	* anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
16	* fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
17	* pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-8	200-280-6		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	* indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
23	* benzo[ghi]perylene	205-563-8	161-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	* coronene	205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-8		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
27	* TPH (C6 to C40) petroleum group		TPH		<38	mg/kg		<38	mg/kg	<0.0038 %		<LOD
28	* polychlorobiphenyls; PCB	602-039-00-4	215-648-1		<35	mg/kg		<35	mg/kg	<0.0035 %		<LOD
29	benzene	601-020-00-8	200-753-7		<0	mg/kg		<0	mg/kg	<0%		<LOD
30	toluene	601-021-00-3	203-625-9		<0	mg/kg		<0	mg/kg	<0%		<LOD
31	* ethylbenzene	601-023-00-4	202-849-4		<0	mg/kg		<0	mg/kg	<0%		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-398-5 [2] 203-576-3 [3] 215-535-7 [4]		<0	mg/kg		<0	mg/kg	<0%		<LOD
33	* chromium in chromium(VI) compounds { chromium(VI) oxide }	624-061-00-0	215-607-8		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
34	* pH		pH		8.12	pH		8.12	pH	8.12 pH		
Total:										0.0131 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- * Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Appendix A: Classifier defined and non CLP determinands

* **cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex**

CLP index number: 048-001-00-5

Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Risk Phrases: None.

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s)/Risk Phrase(s):

29/09/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

* **chromium(III) oxide** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: R61 , R60 , R50/53 , R43 , R42 , R38 , R37 , R36 , R22 , R20

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

* **dicopper oxide; copper (I) oxide** (EC Number: 215-270-7, CAS Number: 1317-39-1)

CLP index number: 029-002-00-X

Description/Comments: M-factor for long-term aquatic hazard not included as per paragraph (5), ATP9

Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)

Additional Risk Phrases: N R50/53 >= 0.25 % , N R50/53

Additional Hazard Statement(s): None.

Reason for additional Hazards Statement(s)/Risk Phrase(s):

10/10/2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

* **lead compounds with the exception of those specified elsewhere in this Annex**

CLP index number: 082-001-00-6

Description/Comments: Least-worst case: Lead REACH Consortium considers some lead compounds Carcinogenic category 2B

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Risk Phrases: None.

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s)/Risk Phrase(s):

03/06/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

* **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: R38 , R37 , R36 , R27 , R26 , R22

Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

* **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: N R51/53 , N R50/53 , R38 , R37 , R36

Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

* **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06/08/2015

Risk Phrases: N R50/53

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400



* **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06/08/2015

Risk Phrases: N R50/53 , R43 , R40 , R38 , R37 , R36 , R22

Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

* **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: N R50/53 , R43 , R38 , R37 , R36

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

* **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21/08/2015

Risk Phrases: N R50/53 , Xn R22

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

* **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21/08/2015

Risk Phrases: N R50/53 , Xi R36/37/38

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

* **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06/08/2015

Risk Phrases: R40

Hazard Statements: Carc. 2 H351

* **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23/07/2015

Risk Phrases: N R50/53

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

* **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25/05/2015

Risk Phrases: None.

Hazard Statements: None.

* **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>

Data source date: 16/06/2014

Risk Phrases: R68/20

Hazard Statements: STOT SE 2 H371

* **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25/05/2015

Risk Phrases: R65 , R63 , R51/53 , R46 , R45 , R10

Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226



* **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Risk Phrases: None.

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s)/Risk Phrase(s):

29/09/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

* **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Risk Phrases: None.

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s)/Risk Phrase(s):

03/06/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

Appendix B: Rationale for selection of metal species

arsenic {arsenic pentoxide}

Worst Case

cadmium {cadmium compounds, with the exception of cadmium sulposelenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Using elemental Cadmium with no CrVI

chromium in chromium(III) compounds {chromium(III) oxide}

Worst case species

copper {dicopper oxide; copper (I) oxide}

Worst case species

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case species

mercury {mercury}

Worst case species

nickel {nickel}

Worst case species

selenium {selenium compounds with the exception of cadmium sulposelenide and those specified elsewhere in this Annex}

Worst case species

zinc {zinc oxide}

Elemental Zinc with no CrVI

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015

HazWasteOnline Classification Engine Version: 2017.349.3471.7048 (16 Dec 2017)

HazWasteOnline Database: 2017.349.3471.7048 (16 Dec 2017)



This classification utilises the following guidance and legislation:

WM3 - Waste Classification - May 2015

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010

2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010



APPENDIX G

Geotechnical Laboratory Data



TEST REPORT.

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Contract

Serial No.

UK17.2707 - Bognor Regis

S32209



CLIENT:

Environmental Protection
Strategies Ltd
7B Caxton House
Broad Street
CAMBOURNE
CAMBRIDGE
CB23 6JN

Soil Property Testing Ltd.

15,16 & 18 Halcyon Court, St Margarets Way,
Stukeley Meadows, Huntingdon,
Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619
Email enquiries@soilpropertytesting.com

SAMPLES SUBMITTED BY:

Environmental Protection

APPROVED SIGNATORIES:

- ☒ J.C.GARNER B.Eng (Hons.) FGS
Technical Director
- ☐ S.P.TOWNEND FGS
Quality Manager
- ☐ W.JOHNSTONE
Materials Lab Manager

SAMPLES LABELLED:

UK17.2707 - Bognor Regis

DATE RECEIVED: 27/11/17

SAMPLES TESTED BETWEEN 27/11/17 and 12/12/17

REMARKS: For the attention of Mr S Cahill
Your reference 18471

- NOTES:**
- 1 All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
 - 2 (a) UKAS - United Kingdom Accreditation Service.
(b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
 - 3 Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
 - 4 This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT.

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Contract
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SCHEDULE OF LABORATORY TESTS

[illegible]

Scheduled by: Environmental Protection

Target Date: 11/12/17



TEST REPORT.

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SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasti- city Index (%)	Liqui- dity Index (%)	SAMPLE PREPARATION				Description	CLASS
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)		
BH1	2.50	D5	18	23	15	8.0	0.63*	S	9 (M)	20	26	Soft pale brown slightly gravelly slightly sandy silty CLAY with rare dark grey organic pockets. Gravel is fine and medium chalk and flint	CL
BH2	1.70	D3	28	44	19	25	0.36	N	0 (A)		25	Firm yellowish brown silty CLAY with occasional black speckling and rare recently active roots	CI
BH2	2.50	D5	22	30	16	14	0.43*	S	2 (M)	22	24	Soft yellowish brown slightly gravelly slightly sandy silty CLAY with occasional light grey mottling. Gravel is fine and medium chalk	CL
TP1	0.00	B1	22	41	18	23	0.17	N	0 (A)		28	Soft yellowish brown silty CLAY with rare fine and medium flint gravel and recently active roots	CI
TP1	1.80	D3	16	22	15	7.0	0.29*	S	4 (M)	17	25	Soft pale olive slightly gravelly slightly sandy chalky CLAY. Gravel is fine and medium chalk and flint	CL
TP5	0.00	B2	20	32	18	14	0.29*	S	11 (M)	22	28	Firm brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse chalk and flint	CL
TP7	1.30	D6	17	19	13	6.0		S	16 (M)		24	Soft mottled light grey and pale olive slightly gravelly slightly sandy chalky CLAY/clayey CHALK. Gravel is fine to coarse chalk and flint	ML
TP8	0.00	B3	21	41	17	24	0.17	N	0 (A)		24	Firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel	CI

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2 S = Wet Sieved Specimen
N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,
C = Core Cutter. A = Assumed, M = Measured

COMMENTS : Liquidity Index, *=calculated liquidity index assumes material greater than 0.425mm non
porous. See BS1377:Part2:1990 Clause 3 Note 1.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin
of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasti- city Index (%)	Liqui- dity Index (%)	SAMPLE PREPARATION				Description	CLASS
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)		
TP8	0.80	D7	22	39	17	22	0.23	N	0 (A)		25	Firm yellowish brown slightly sandy silty CLAY with rare black speckling and fine chalk gravel	CI

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

S = Wet Sieved Specimen
N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,
C = Core Cutter. A = Assumed, M = Measured

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin
of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



TEST REPORT.

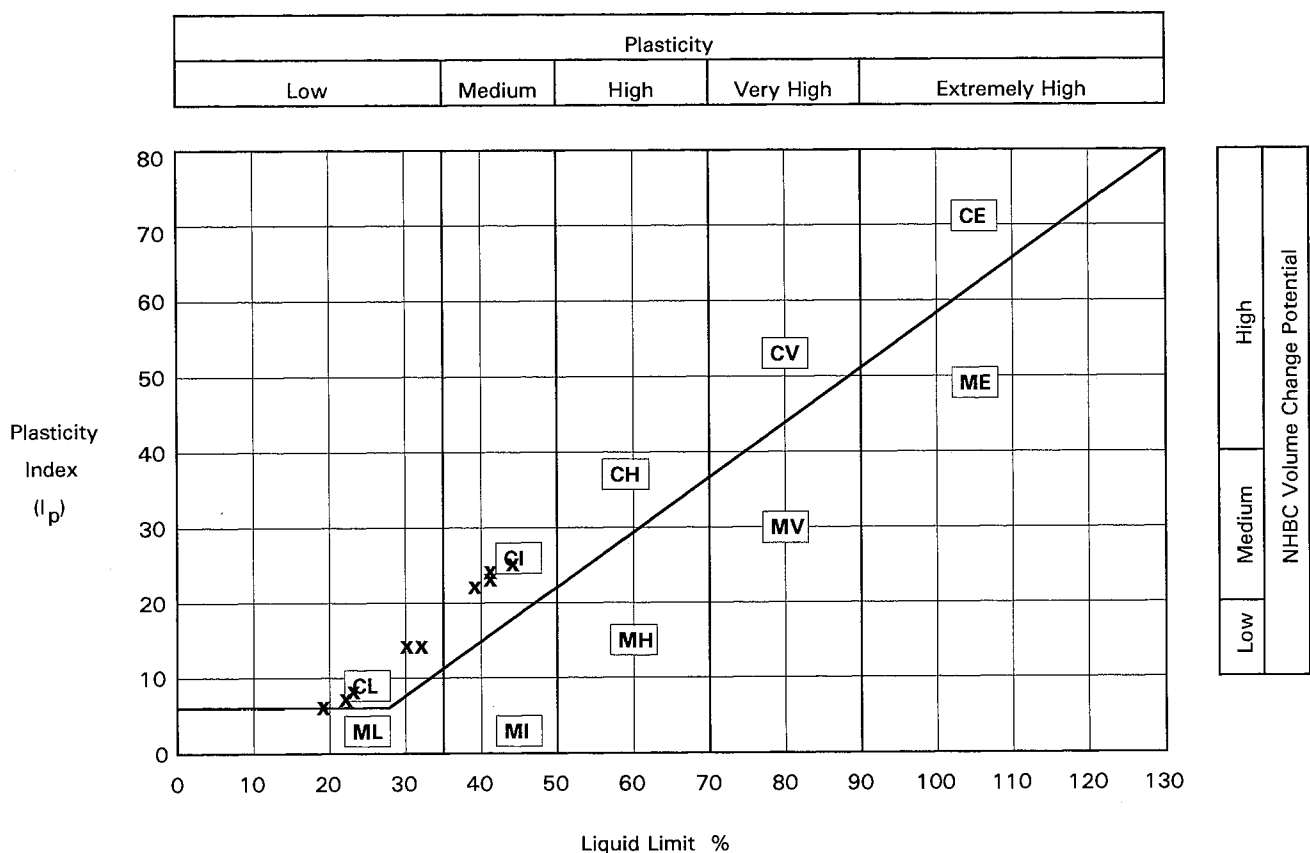
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PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
PLASTICITY CHART BS5930:1999:Figure 18
Test not UKAS accredited.



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

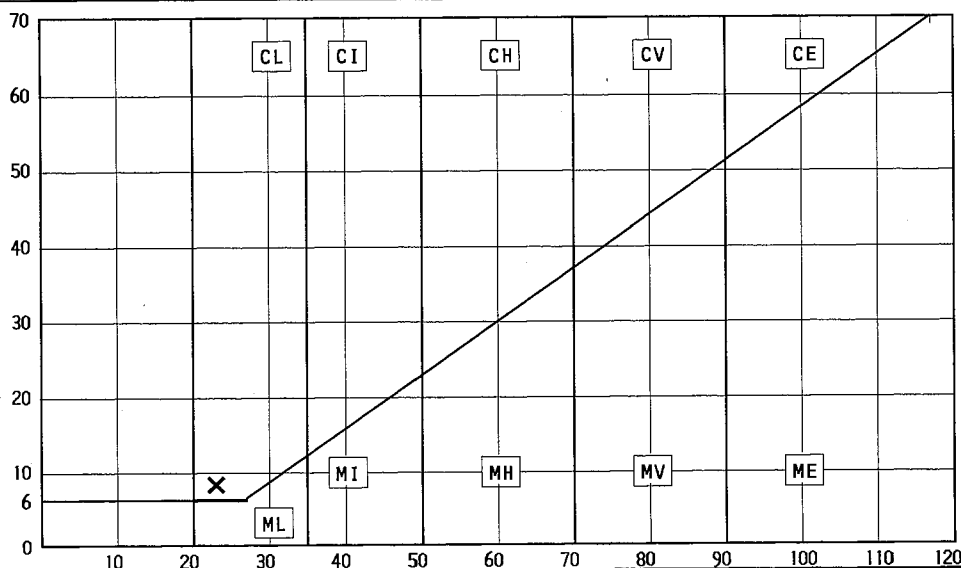
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH1	2.50	D5	18	Soft pale brown slightly gravelly slightly sandy silty CLAY with rare dark grey organic pockets. Gravel is fine and medium chalk and flint	

PREPARATION		Liquid Limit	23 %
Method of Preparation	Sieved Specimen	Plastic Limit	15 %
Sample retained 0.425 sieve (Measured)	9 %	Plasticity Index	8.0 %
Corrected moisture content for material passing 0.425mm	20 %	Liquidity Index	0.63
Curing Time	26 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low

NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I_p' = I_p x (% less than 425 microns/100)
7% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

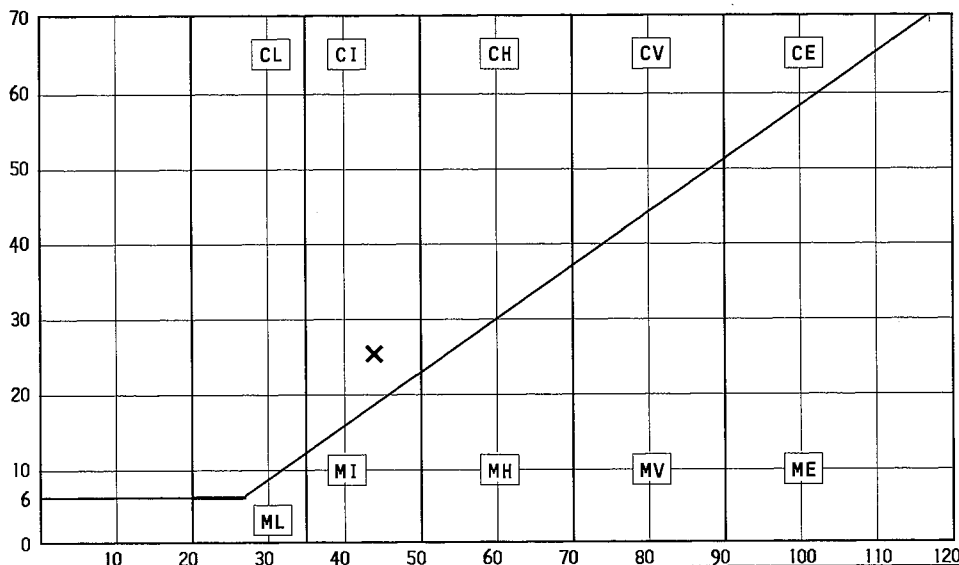
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH2	1.70	D3	28	Firm yellowish brown silty CLAY with occasional black speckling and rare recently active roots	

PREPARATION				Liquid Limit	44 %
Method of Preparation Specimen from Natural Soil				Plastic Limit	19 %
Sample retained 0.425 sieve (Assumed) 0 %				Plasticity Index	25 %
Corrected moisture content for material passing 0.425mm %				Liquidity Index	0.36
Curing Time 25 Hours				Clay Content	Not analysed. %
				Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low
NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I_p = I_p x (% less than 425 microns/100)



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

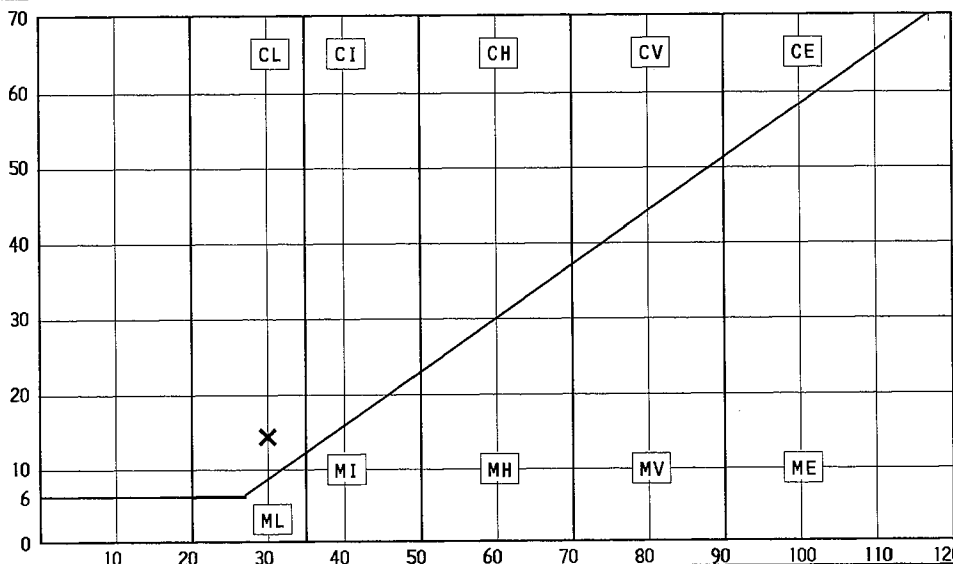
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH2	2.50	D5	22	Soft yellowish brown slightly gravelly slightly sandy silty CLAY with occasional light grey mottling. Gravel is fine and medium chalk	

PREPARATION		Liquid Limit	30 %
Method of Preparation Sieved Specimen		Plastic Limit	16 %
Sample retained 0.425 sieve (Measured) 2 %		Plasticity Index	14 %
Corrected moisture content for material passing 0.425mm 22 %		Liquidity Index	0.43
Curing Time 24 Hours		Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low
NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I_p = I_p x (% less than 425 microns/100)
1% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

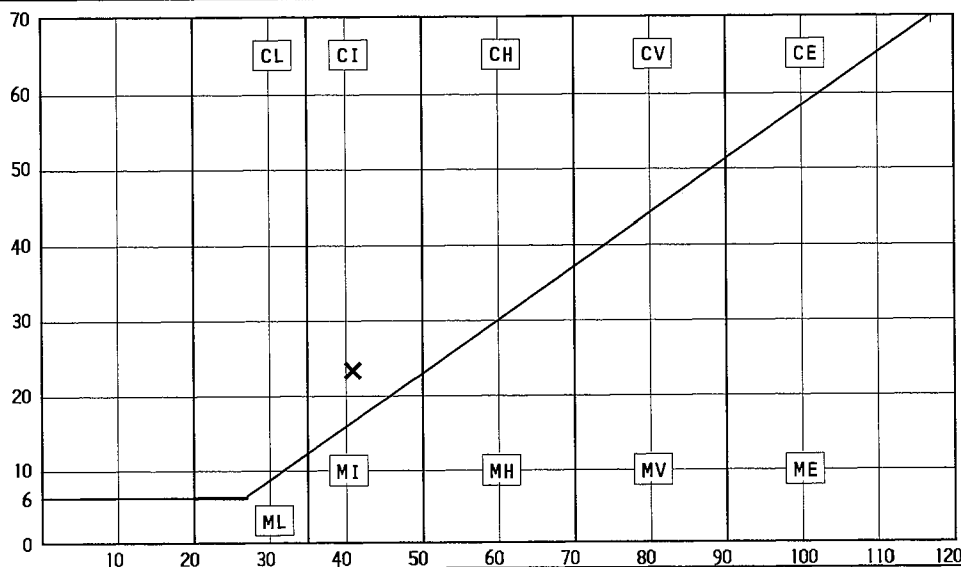
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
TP1	0.00	B1	22	Soft yellowish brown silty CLAY with rare fine and medium flint gravel and recently active roots	

PREPARATION		Liquid Limit	41 %
Method of Preparation	Specimen from Natural Soil	Plastic Limit	18 %
Sample retained 0.425 sieve (Assumed)	0 %	Plasticity Index	23 %
Corrected moisture content for material passing 0.425mm	%	Liquidity Index	0.17
Curing Time	28 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low

NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'_p = I_p x (% less than 425 microns/100)



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

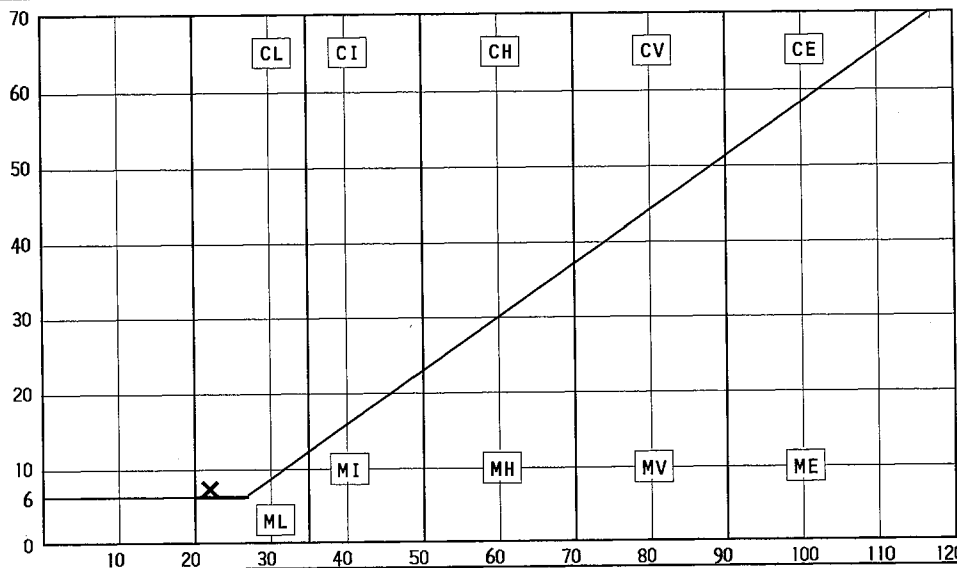
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
TP1	1.80	D3	16	Soft pale olive slightly gravelly slightly sandy chalky CLAY. Gravel is fine and medium chalk and flint	

PREPARATION		Liquid Limit	22 %
Method of Preparation Sieved Specimen		Plastic Limit	15 %
Sample retained 0.425 sieve (Measured)	4 %	Plasticity Index	7.0 %
Corrected moisture content for material passing 0.425mm	17 %	Liquidity Index	0.29
Curing Time	25 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low

NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I_p' = I_p x (% less than 425 microns/100)
4% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.



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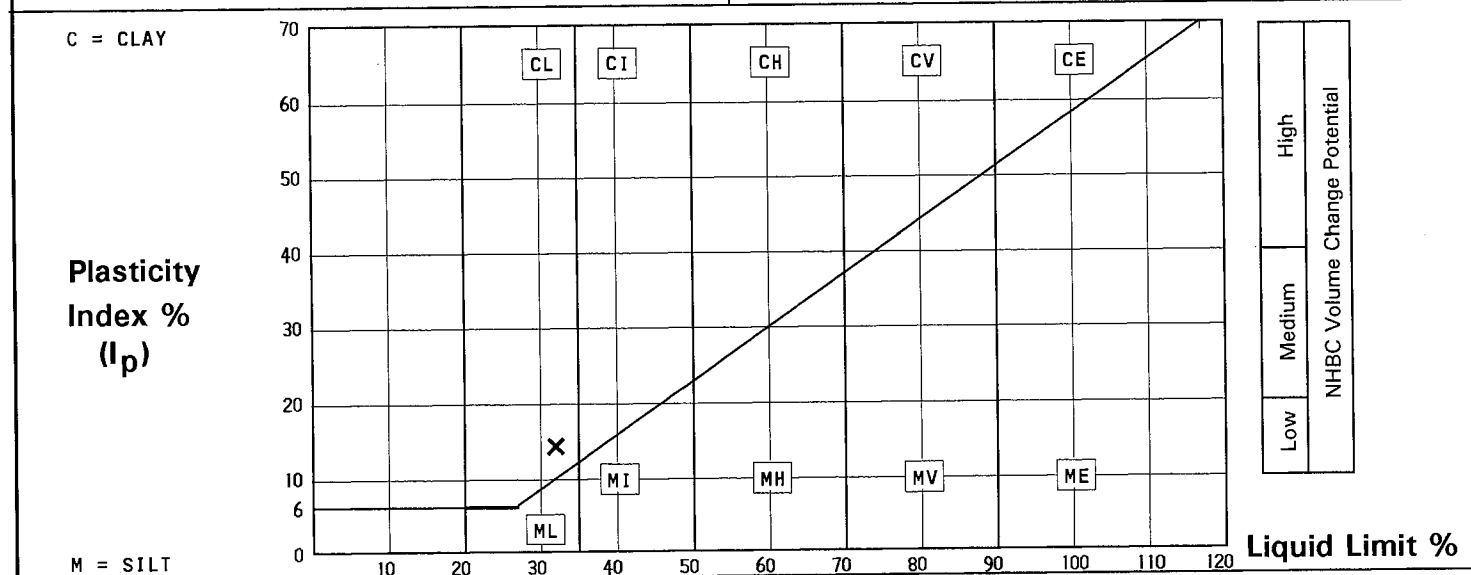
Serial No.
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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
TP5	0.00	B2	20	Firm brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse chalk and flint	

PREPARATION				Liquid Limit	32 %
Method of Preparation Sieved Specimen				Plastic Limit	18 %
Sample retained 0.425 sieve (Measured) 11 %				Plasticity Index	14 %
Corrected moisture content for material passing 0.425mm 22 %				Liquidity Index	0.29
Curing Time 28 Hours				Clay Content	Not analysed. %
				Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'_p = I_p x (% less than 425 microns/100)
10% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

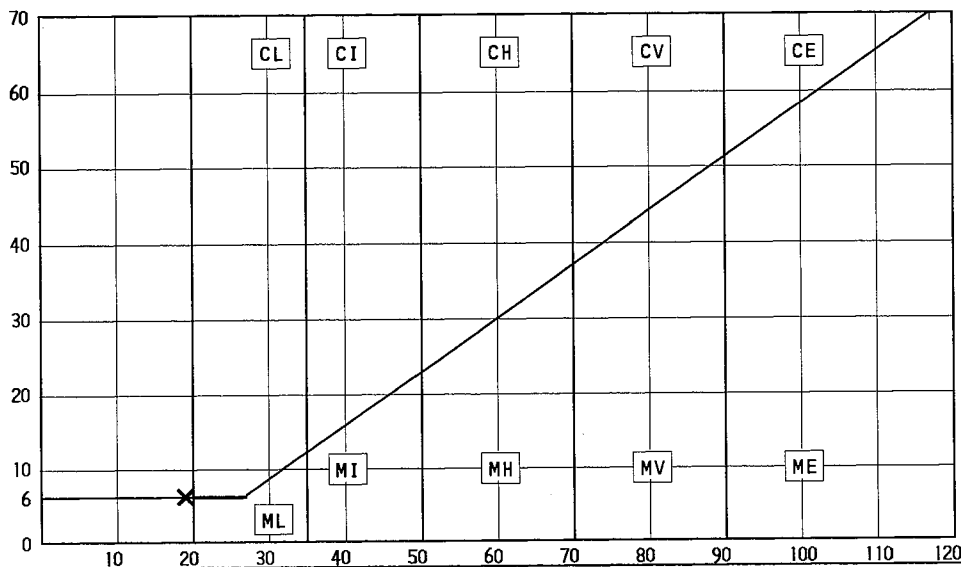
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
TP7	1.30	D6	17	Soft mottled light grey and pale olive slightly gravelly slightly sandy chalky CLAY/clayey CHALK. Gravel is fine to coarse chalk and flint	

PREPARATION		Liquid Limit	19 %
Method of Preparation	Sieved Specimen	Plastic Limit	13 %
Sample retained 0.425 sieve (Measured)	16 %	Plasticity Index	6.0 %
Corrected moisture content for material passing 0.425mm	%	Liquidity Index	
Curing Time	24 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low

NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I_p = I_p x (% less than 425 microns/100)
Corrected moisture content and liquidity index not reported due to material type - 11% retained on 2mm sieve.



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

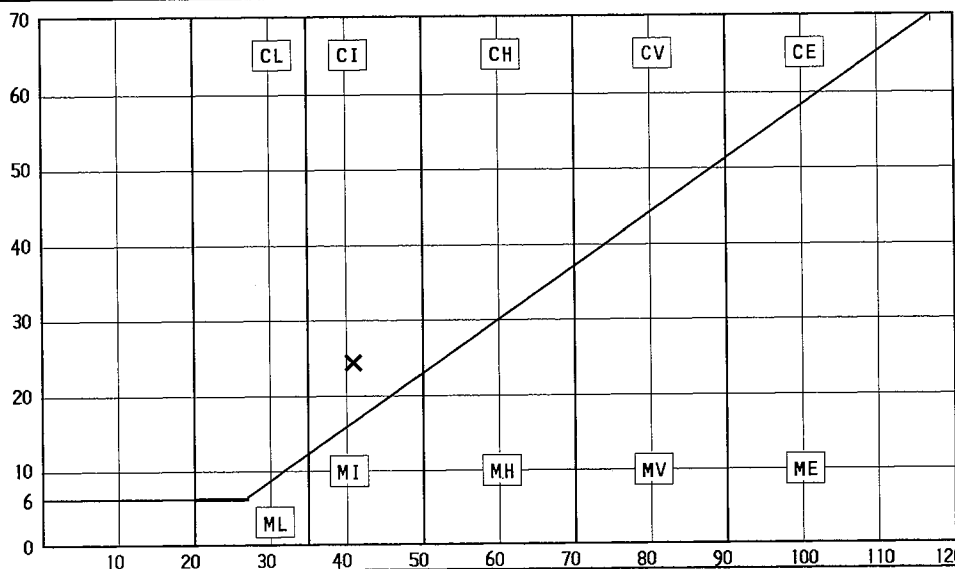
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
TP8	0.00	B3	21	Firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel	

PREPARATION				Liquid Limit	41 %
Method of Preparation Specimen from Natural Soil				Plastic Limit	17 %
Sample retained 0.425 sieve (Assumed) 0 %				Plasticity Index	24 %
Corrected moisture content for material passing 0.425mm %				Liquidity Index	0.17
Curing Time 24 Hours				Clay Content	Not analysed. %
				Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low

NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,
C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I_p = I_p x (% less than 425 microns/100)
<1% gravel by dry mass picked out by hand and excluded from limits tests.



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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

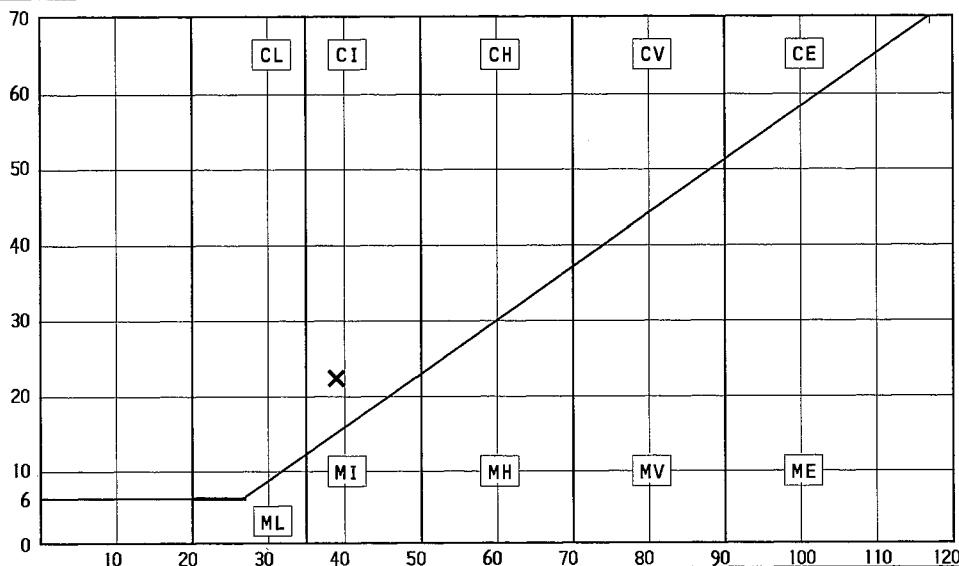
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
TP8	0.80	D7	22	Firm yellowish brown slightly sandy silty CLAY with rare black speckling and fine chalk gravel	

PREPARATION				Liquid Limit	39 %
Method of Preparation Specimen from Natural Soil				Plastic Limit	17 %
Sample retained 0.425 sieve (Assumed) 0 %				Plasticity Index	22 %
Corrected moisture content for material passing 0.425mm %				Liquidity Index	0.23
Curing Time 25 Hours				Clay Content	Not analysed. %
				Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low

NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,
C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
<1% gravel by dry mass picked out by hand and excluded from limits tests.



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DETERMINATION OF SATURATION MOISTURE CONTENT OF CHALK

Borehole/ Pit No.	Depth m.	Sample	Saturation Moisture Content %	Description	Remarks
BH1	16.50	B32A	24	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL
BH1	16.50	B32B	24	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL
BH2	7.50	B16A	23	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL
BH2	7.50	B16B	24	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.3

METHOD OF TEST : BS 1377:PART 2:1990:3.3

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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DETERMINATION OF DENSITY AND MOISTURE CONTENT

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Description	Remarks
BH1	16.50	B32A	24	2.03	1.64	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL
BH1	16.50	B32B	25	2.03	1.62	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL
BH2	7.50	B16A	23	2.05	1.67	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL
BH2	7.50	B16B	24	2.04	1.65	White intact CHALK fragment of coarse gravel size	Volume of test specimen less than the required 300mL

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4.2 & 8 PART 2:1990:7.2

METHOD OF TEST : BS 1377:PART 2:1990:3 Determination of Moisture Content 1990:7 Determination of Density

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Density determined by immersion in water as part of the saturation moisture content test

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

SPTR2H



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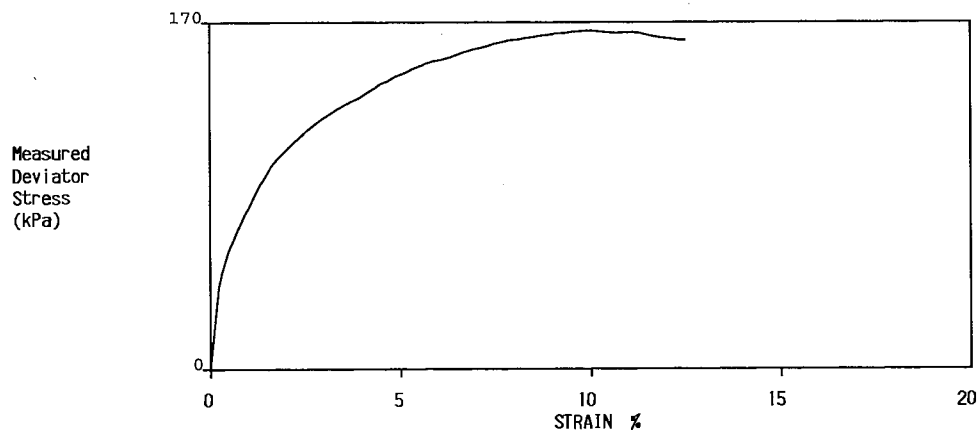
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DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description				Remarks	
BH2	1.20	U2	Stiff (High strength) light orangish brown silty CLAY with rare light brownish grey mottling					
Initial Specimen								
	Depth of Top of Specimen (m)	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m ³	Dry Density Mg/m ³	
	1.30	199.8	102.4	3277	24	1.99	1.60	

TEST INFORMATION Rate of Strain 1.0 % per Min Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure σ_3 (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma_1 - \sigma_3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma_1 - \sigma_3)_f$ (kPa)	Mohr's Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	23	9.7	0.7	/	165	83		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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LABORATORY CALIFORNIA BEARING RATIO TESTS ADJUSTED FOR SEASONAL MOISTURE CONTENT CHANGES.

Due to seasonal variations of water content in near surface soils, many clients require CBR test samples to be subjected to sample preparation in the laboratory before testing. With Clay soils, liquid and plastic limits and moisture contents are carried out to classify them on material passing 20mm. The plastic limit is then compared against the moisture content with due regard to the proportion of material then retained on a 0.425mm sieve. If the moisture content is already 2% or more above the plastic limit, compaction may take place immediately. If this is not the case a calculated amount of water is added to the sample and cured for 24 hours before compaction. The samples are then cured for a further 24 hours before CBR tests are carried out at both the top and bottom of the sample.

CALCULATION OF ADJUSTED MOISTURE CONTENT FOR CBR TESTING

When a significant proportion of a basically clay, material is >0.425mm, the adjusted moisture content (MC) for test shall be derived as follows:

Obtain test specimens for CBR, Limits and Moisture content from Material Passing 20mm. (If the sample is large enough a moisture content may also be carried out on a representative portion of the whole sample including material greater than 20mm, and reported for information)

The Plastic Limit (PL) for the fine fraction is obtained by testing material passing the 0.425mm sieve. A notional 5% Moisture Content is to be allowed for material passing 20mm, and retained on the 0.425mm sieve. The proportion passing the 0.425mm is obtained by the wet sieve preparation method.

If X% passes 0.425mm, (100-X) % is retained on 0.425mm and with the 5% MC required to be incorporated for the retained 0.425mm portion, the adjusted MC for test shall be at least:

$$\frac{X(PL+2) + (100-X)5}{100} \text{ for the sample passing 20mm}$$

CALCULATIONS:

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TP1 B1 @ 0.00m

100% passing 0.425mm therefore X = 100

Plastic limit of specimen = 18.3%

Moisture content as received = 21.8% (excluding +20mm)

(0% retained on 20mm sieve and excluded from tests)

Therefore, moisture content adjustment not required

Moisture Content after CBR Test = 21%



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TP5 B2 @ 0.00m

89% passing 0.425mm therefore X = 89

Plastic limit of specimen = 17.6%

Moisture content as received = 19.6% (excluding +20mm)
(2% retained on 20mm sieve and excluded from tests)

$$\frac{89(17.6+2) + (100-89)5}{100} = 18.0\%$$

Therefore, moisture content adjustment not required

Moisture Content after CBR Test = 19%

TP8 B3 @ 0.00m

100% passing 0.425mm therefore X = 100

Plastic limit of specimen = 17.0%

Moisture content as received = 21.3% (excluding +20mm)
(0% retained on 20mm sieve and excluded from tests)

Therefore, moisture content adjustment not required

Moisture Content after CBR Test = 21%



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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

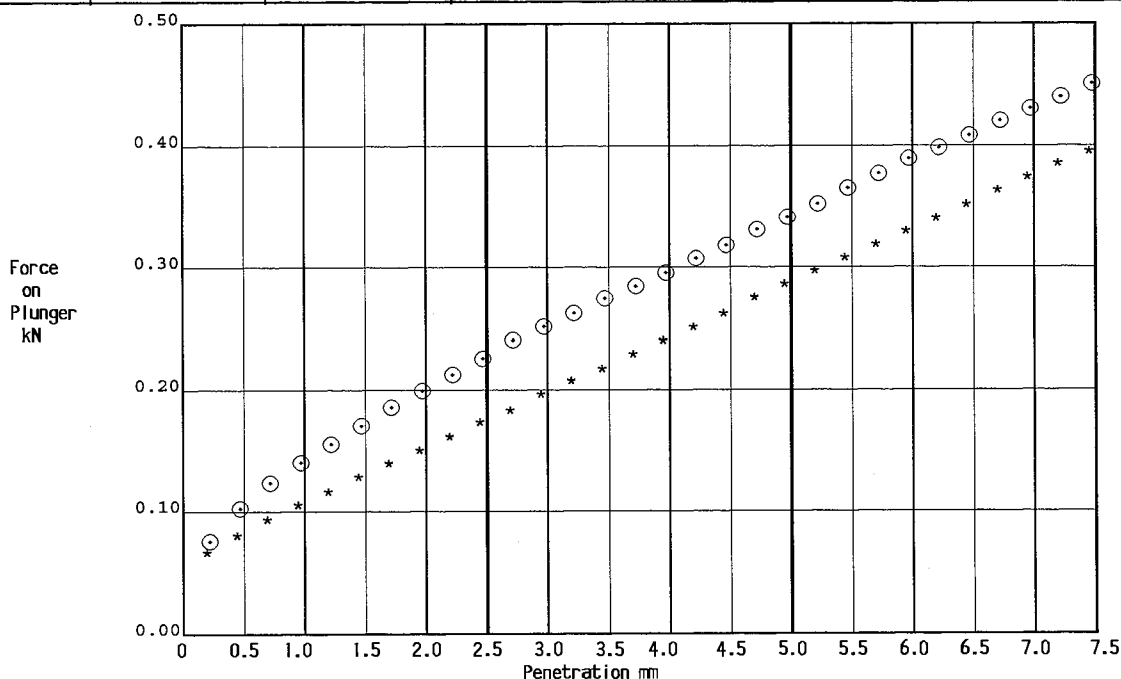
Borehole/ Pit No./ Chainage	Depth m.	Sample	Description	Remarks
TP1	0.00	B1	Soft yellowish brown silty CLAY with rare fine and medium flint gravel and recently active roots	

Moisture Content % TOP: 21 BOTTOM: 21 Average: 21

Bulk Density Mg/m³ 2.02 Dry Density Mg/m³ 1.67

CBR VALUES

Penetration mm	Force kN	Calculated CBR %	Corrected CBR %	Highest CBR %	Average CBR % (Shown if Top & Bottom CBR Values are within 10% of their Mean value)	% material retained on 20mm sieve and removed before test : 0
TOP *	2.5 5.0	0.17 0.28	1.3 1.4		1.4	METHOD OF PREPARATION BS 1377:Part 4:1990 7.2.4 2.5kg Rammer Method.
BOTTOM ⊙	2.5 5.0	0.23 0.34	1.7 1.7		1.6	
						Surcharge weights (kg) : 15
						SOAKED TEST : NO



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.6.1 & 7.6.5 & PART 4:1990:7.2

METHOD OF TEST : BS 1377:PART 4:1990:7.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : UKAS Calibration from 0.2 to 50kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Borehole/ Pit No./ Chainage	Depth m.	Sample	Description	Remarks
TP5	0.00	B2	Firm brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse chalk and flint	

Moisture Content % TOP: 19 BOTTOM: 19 Average: 19

Bulk Density Mg/m³ 2.04 Dry Density Mg/m³ 1.71

CBR VALUES

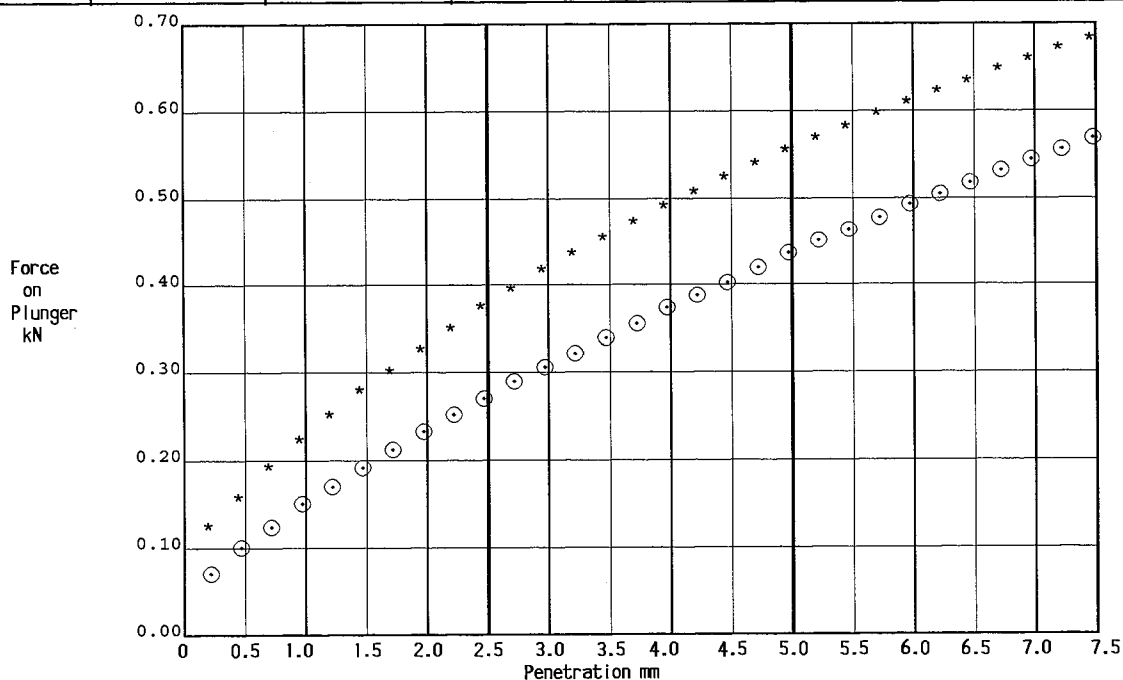
Penetration mm	Force kN	Calculated CBR %	Corrected CBR %	Highest CBR %	Average CBR % (Shown if Top & Bottom CBR Values are within 10% of their Mean Value)	% material retained on 20mm sieve and removed before test : 2
TOP	2.5	0.37	2.8			
	5.0	0.55	2.8	2.8		
BOTTOM	2.5	0.27	2.1			
	5.0	0.44	2.2	2.2		

METHOD OF PREPARATION

BS 1377:Part 4:1990 7.2.4 2.5kg
Rammer Method.

Surcharge weights (kg) : 15

SOAKED TEST : NO



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.6.1 & 7.6.5 & PART 4:1990:7.2

METHOD OF TEST : BS 1377:PART 4:1990:7.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,
C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin
of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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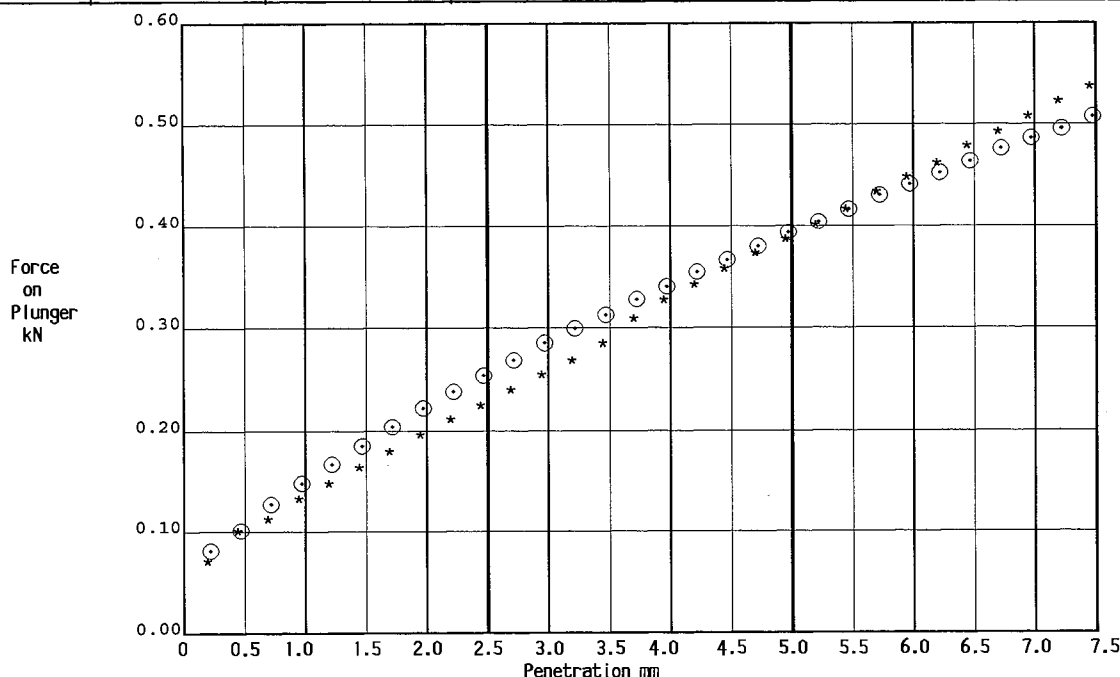
DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

Borehole/ Pit No./ Chainage	Depth m.	Sample	Description	Remarks
TP8	0.00	B3	Firm yellowish brown slightly sandy silty CLAY with rare fine and medium flint gravel	

Moisture Content % TOP: 21 BOTTOM: 21 Average: 21 Bulk Density Mg/m³ 2.04 Dry Density Mg/m³ 1.68

CBR VALUES

Penetration mm	Force kN	Calculated CBR %	Corrected CBR %	Highest CBR %	Average CBR % (Shown if Top & Bottom CBR Values are within 10% of their Mean value)	% material retained on 20mm sieve and removed before test : 0
TOP *	2.5 5.0	0.22 0.38	1.7 1.9		1.9	METHOD OF PREPARATION BS 1377:Part 4:1990 7.2.4 2.5kg Rammer Method.
BOTTOM ○	2.5 5.0	0.26 0.39	1.9 2.0		2.0	Surcharge weights (kg) : 15 SOAKED TEST : NO



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.6.1 & 7.6.5 & PART 4:1990:7.2

METHOD OF TEST : BS 1377:PART 4:1990:7.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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DETERMINATION OF THE SULPHATE CONTENT OF SOIL AND GROUNDWATER

Borehole/ Pit No.	Depth m.	Sample	Concentration of Soluble Sulphate			% of sample passing 2mm sieve	Description	Remarks
			Acid Soluble SO ₃ %	Water Soluble 2:1 SO ₃ g/l	Groundwater g/l			
BH2	2.50	D5		0.07		99	Soft yellowish brown slightly gravelly slightly sandy silty CLAY with occasional light grey mottling. Gravel is fine and medium chalk	
BH2	7.50	B16		0.08		76	White structureless CHALK with harder intact chalk fragments from fine to coarse gravel size and rare black flint gravel	
TP7	1.30	D6		0.02		89	Soft mottled light grey and pale olive slightly gravelly slightly sandy chalky CLAY/clayey CHALK. Gravel is fine to coarse chalk and flint	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.5 BS1377:PART 3:1990:5.2 Acid Soluble, 5.3 Soil/Water Extract
:5.4 Groundwater

METHOD OF TEST : BS 1377:PART 3:1990:5.5

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample,
C = Core Cutter

COMMENTS : Test not UKAS accredited.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin
of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



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DETERMINATION OF THE pH VALUE

Borehole/ Pit No.	Depth m.	Sample	pH Value	Description	Remarks
BH2	2.50	D5	8.0	Soft yellowish brown slightly gravelly slightly sandy silty CLAY with occasional light grey mottling. Gravel is fine and medium chalk	
BH2	7.50	B16	7.8	White structureless CHALK with harder intact chalk fragments from fine to coarse gravel size and rare black flint gravel	
TP7	1.30	D6	8.2	Soft mottled light grey and pale olive slightly gravelly slightly sandy chalky CLAY/clayey CHALK. Gravel is fine to coarse chalk and flint	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7 BS 1377:PART 3:1990:9.4

METHOD OF TEST : BS 1377:PART 3:1990:9.5

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Test not UKAS accredited.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



APPENDIX H

Generic Risk Screening Criteria

EPS Generic Quantitative Risk Assessment

Minimal Risk Generic Screening Criteria - Commercial Land Use

Contaminant	Soil Targets			Groundwater Targets	
	Human Health	Controlled Waters		Controlled Waters	
		LGwRP	HGwRP	LGwRP	HGwRP
Unit	mg/kg			ug/l	
Arsenic	640	n/c	n/c	50	10
Cadmium	190	n/c	n/c	5	5
Chromium III	8600	n/c	n/c	250	50
Chromium VI	33	n/c	n/c	n/c	n/c
Copper	68000	n/c	n/c	28	28
Mercury (elemental)	58	n/c	n/c	1	1
Nickel	980	n/c	n/c	200	50
Lead	NA	n/c	n/c	250	10
Selenium	12000	n/c	n/c	10	10
Zinc	730000	n/c	n/c	500	500
Benzene	27	0.252	0.008	30	1
Toluene	56000* (869)	1.17	1.17	50	50
Ethylbenzene	5700* (518)	15.0	10.0	300	200
Xylene (Para)	5900** (576)	0.885	0.885	30	30
MTBE#	7900	0.138	0.0276	75	15
Benzo(a)Pyrene	35	10	1.44	0.7	0.1
Naphthalene	190** (76.4)	0.934	0.02	10	0.1
Dibenz(ah)anthracene	3.5	n/c	n/c	n/c	n/c
Aliphatic C5-C6	3200** (304)	5.27	1.05	50	10
Aliphatic C6-C8	7800** (144)	23.2	4.64	50	10
Aliphatic C8-C10	2000** (78)	175	35.1	50	10
Aliphatic C10-C12	9700** (48)	1380	276	50	10
Aliphatic C12-C16	59000** (24)	27500	5490	50	10
Aliphatic C16-C35	1600000	3.46E+06	6.91E+05	50	10
Aromatic C8-C10	3500* (613)	8.74	1.75	50	10
Aromatic C10-C12	16000** (364)	13.8	2.76	50	10
Aromatic C12-C16	36000** (169)	27.5	5.5	50	10
Aromatic C16-C21	28000	86.9	17.4	50	10
Aromatic C21-C35	28000	690	138	50	10

Notes:

LGwRP - Low Groundwater Resource Potential HGwRP - High Groundwater Resource Potential

f = Oral, dermal and inhalation exposure compared with oral HCV N/C = Not

* = S4UL exceeds vapour saturation limit (in brackets) ** = S4UL exceeds solubility saturation limit (in

Soil Targets

Targets for Human Health have been taken from *S4ULs 'Suitable For Use Levels for Human Health Risk Assessment' – LQM and CIEH (2014)* derived using standard sandy loam soil with 1% SOM, except (#) = *EIC/AGS/CL:AIRE GAC 'Soil Generic Assessment Criteria' (2010)*. For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the generic human health targets may be revised.

Targets for Controlled waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for LGwRP and HGwRP respectively (see notes for GW targets).

Groundwater Targets

For LGwRP, targets have been taken as Freshwater EQS where available. For Ethylbenzene and BaP the WHO Health limit has been used and for MTBE and individual TPH fractions a 5 times multiplier of taste threshold and UKDWS has been taken respectively.

For HGwRP, targets have been taken as UKDWS where available, with the exception of Copper and Zinc where the EQS is lower than the DWS and therefore the EQS has been used as the groundwater target. For Ethylbenzene the upper WHO ATO limit has been used. For Toluene and Xylene, the WHO ATO limit is higher than the EQS and so the lower value has been taken. For MTBE the taste threshold has been taken.



EPS Generic Quantitative Risk Assessment

Low Risk Generic Screening Criteria - All Land Uses

	Soil Targets					
Contaminant	Residential		Allotments	Commercial	Public Open Spaces	
	With Home Grown Produce	Without Home Grown Produce			Residential	Parks
Unit	mg/kg					
Arsenic	37	40	49	640	79	168
Benzene	0.87	3.3	0.18	98	140	230
Benzo(a)pyrene	5	5.3	5.7	76	10	21
Cadmium	26	149	4.9	410	220	880
Chromium (VI)	21	21	170	49	23	250
Lead	200	310	80	2330	630	1300

Notes:

Targets for Human Health have been taken from available Category 4 Screening Levels (C4SLs) for assessment of land affected by contamination issued by DEFRA in December 2013.



APPENDIX I

Method Statement for Encountering Unexpected Contamination



METHOD STATEMENT

ACTIONS TO BE TAKEN IN THE EVENT OF DISCOVERING UNEXPECTED CONTAMINATION DURING INTRUSIVE GROUNDWORKS

If at any point during intrusive groundworks at a site, evidence of unforeseen contamination is encountered in the form of significant noxious odours, discolouration, or instability within soils or sheen/ discolouration in groundwater, the following actions will be taken:

- Intrusive works in the immediate area of the impacted ground will be suspended and the continuation of work in other areas of the site will be considered within the context of the site specific health & safety plan.
- Environmental Protection Strategies Ltd (EPS) will be contacted and appraised of the situation so that arrangements can be made to characterise the impact and determine what action may be necessary in addition to the scheduled site works. Where possible / health & safety plan permits, digital photographs of the impacted ground will be taken and emailed to EPS at the address below to assist in the initial assessment.
- It may well be necessary for EPS to attend site to undertake visual inspection and obtain samples for field and/or laboratory analysis, although the actions taken will be dependent on the nature of what is encountered.
- In cases where EPS consider the unforeseen contamination likely to pose a significant risk of significant harm to adjacent site users or local environmental receptors, the local authority and the Environment Agency will be informed of the situation and the actions being taken.
- Once appropriate action has been agreed and undertaken, a written summary will be produced by EPS for submission to the Local Authority, (and where relevant, the Environment Agency) in accordance with planning requirements. The submission will include details of work undertaken, analytical results of investigative and validation samples obtained and conclusions and recommendations for any further actions considered necessary.
- Where regulatory bodies have been involved, site works should only recommence following their agreement and in all cases should only recommence when the site manager considers it safe to do so within the context of the site specific health & safety plan.

EPS Contact Details:

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Email: info@epstrategies.co.uk (Automatically forwarded to the above and office based personnel.)