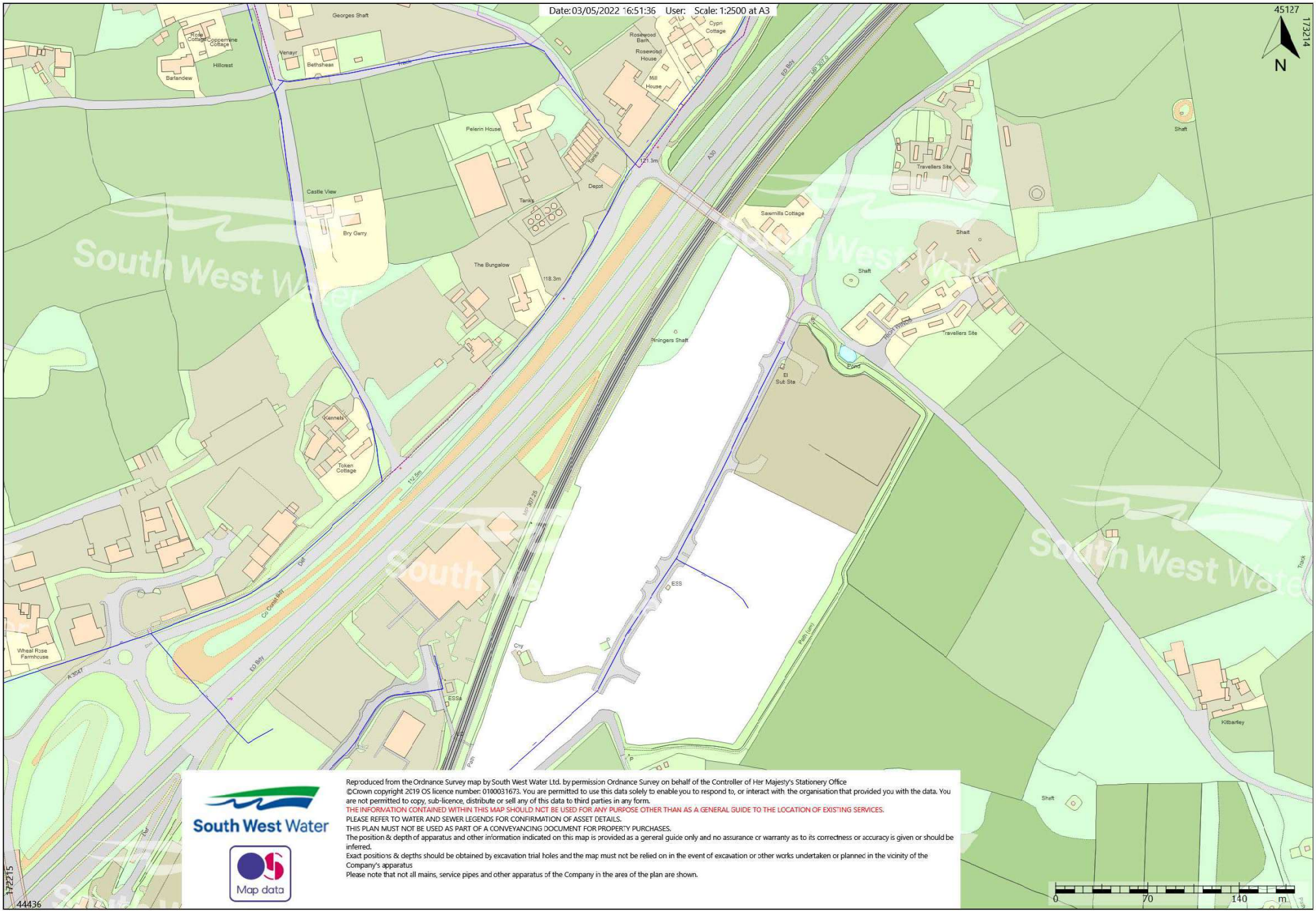
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Rose Cottage
Coppermine Cottage
Hillcrest
Befandew
Venayr
Bethshean
Track
Rosewood Barn
Rosewood House
Mill House
Cypri Cottage
Pelerin House
Tanks
Depot
121.3m
A30
Castle View
Bry Garry
Tanks
The Bungalow
118.3m
Sawmills Cottage
Shaft
Travellers Site
Shaft
Shaft
Travellers Site
Pininger's Shaft
Pond
El Sub Sta
Kennels
Token Cottage
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Map data
Reproduced from the Ordnance Survey map by South West Water Ltd. by permission Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office
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Exact positions & depths should be obtained by excavation trial holes and the map must not be relied on in the event of excavation or other works undertaken or planned in the vicinity of the Company's apparatus
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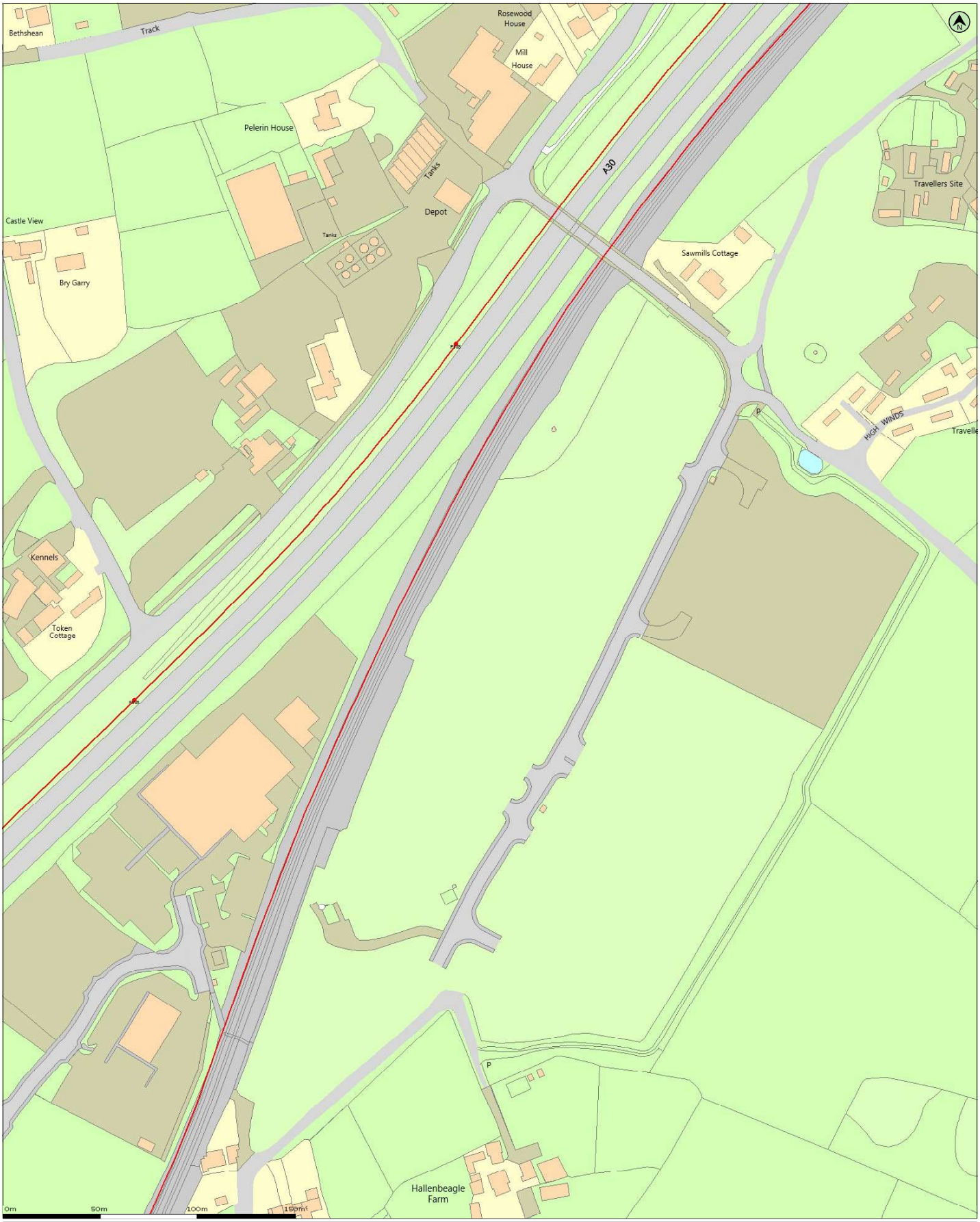

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Date: 04/06/22
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Duct, Trench

Chamber / Pole

Cabinet

melsom@rsk.co.uk

315111

APPENDIX G
SITE RECONNAISSANCE PHOTOGRAPHS

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 1	
Date: 20/06/22	
Facing south west towards original Cornish Engine houses /chimneys. Eastern boundary marked by a metal fence.	

Photo No. 2	
Date: 20/06/22	
Facing north east towards farm house.	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 3	
Date: 20/06/22	
Entrance gate in north east corner.	

Photo No. 4	
Date: 20/06/22	
Facing north west towards the railway, A30 and commercial properties beyond. Railway line significantly lower than site level. Cornish hedge and protective barrier.	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 5	
Date: 20/06/22	
Manhole in north west corner.	

Photo No. 6	
Date: 20/06/22	
Manhole on northern boundary (approxim-ately in line with house across the road).	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 7	
Date: 20/06/22	
Facing south west from north west corner.	

Photo No. 8	
Date: 20/06/22	
Facing south west towards the Cornish Engine Houses /chimneys from approximately half along the western boundary. Barrier and Cornish hedges extend slightly inwards.	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 9	
Date: 20/06/22	
Southern end of site along the railway boundary. Site is nearly level with the railway.	

Photo No. 10	
Date: 20/06/22	
South west corner.	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 11	
Date: 20/06/22	
South east corner facing chimney ruins.	

Photo No. 12	
Date: 20/06/22	
Substation located adjacent to site towards the south east. Stockpiles observed between 1.0 - 2.0 m high.	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle, Scorrier

Photo No. 13	
Date: 20/06/22	
Facing north across the stockpiles (in the southern end of site).	

APPENDIX H
TECHNICAL BACKGROUND

H1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the

likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- Highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- Likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- Low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- Unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- Severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- Medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- Mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- Minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- Very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- High: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- Moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- Low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- Very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be seen

Appendix B

Hallenbeagle Phase 2 Geo-environmental Site Investigation

SUEZ Recycling and Recovery UK Ltd

Hallenbeagle

Phase 2 Geo-environmental Site Investigation (Planning Phase)

315111-R02 (01)

RSK GEOSCIENCES

September 2022

RSK GENERAL NOTES

Project No.: 315111

Title: Phase 2 Geo-environmental Site Investigation (Planning Phase): Hallenbeagle, Redruth, TR16 5BN

Client: SUEZ Recycling and Recovery UK Ltd

Date: September 2022

Office: RSK Environment Limited, The Old School House, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel 0117 947 1000

Status: Rev 01

Author	Rachael Lockyer	**Technical reviewer**	Jeremy Leach
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Revision control sheet				
Revision ref.	**Date**	**Reason for revision**	**Amended by:**	**Approved by:**
Rev 00	08/2022	First issue	n/a	see above
Rev 01	09/2022	Second issue	RL	see above

CONTENTS

FIGURES

APPENDICES

EXECUTIVE SUMMARY

Commissioning and purpose of assessment	RSK Environment Limited (RSK) was commissioned by SUEZ Recycling and Recovery UK Ltd to carry out a Phase 2 Geo-environmental Site Investigation (Planning Phase) of the land at Hallenbeagle, , Redruth, TR16 5BN, grid reference 172714, 044783. The overall aim of the project was to assess land contamination sources to the proposed development and assess the viability of soakaway features.
DESK-BASED ASSESSMENT	
Site description and proposed development	The site is currently unoccupied, covers an area of 3.04 hectares and is being considered for commercial use.
History of site and surrounding area	The site was formerly used for metalliferous mining. Potential sources of contamination identified on-site comprise Made Ground including trace of mine waste material. Several potentially contaminative current activities have been identified in the surrounding area, including Made Ground associated with historical mining and railway land.
Previous site investigation (SI) reports	A variety of previous geoenvironmental, mining and ecological investigation reports have been provided and detailed in RSK's Phase 1 Desk Study.
Geology and environmental setting	The Site is underlain by various types of Made Ground over weathered metasandstone and metamudstone of the Porthtowan Formation. Environmental receptors identified comprise: • Groundwater within The Porthtowan Formation is classified as a secondary aquifer.
INTRUSIVE INVESTIGATION & ASSESSMENT	
SI scope	Trial pitting and rotary open holes to obtain information on the ground conditions and associated contamination risks. In situ infiltration testing, soil sampling, laboratory testing, groundwater and ground gas monitoring of installed boreholes Interpretation of data to develop a refined conceptual site model (CSM) Generic quantitative risk assessment (GQRA) of relevant contaminant linkages Preliminary assessment of the potential waste classification
SI factual findings	The majority of site is underlain by Made Ground over weathered Porthtowan Formation. Where remediated mining features were identified, the ground profile generally included two types of Made Ground over a layer of concrete.
Refined conceptual site model and geo-environmental assessment	The results of the site investigation and GQRA indicate that relevant contaminant linkages are present: • Direct contact by future users with contaminants in the Made Ground

Recommendations including issues for further assessment	The following recommendations are made for further assessment of the site to address the risks identified above and to address remaining uncertainties: • Additional infiltration testing in the area of the southern infiltration tank and foul soakaway area following the poor results achieved • Continue to assess monitoring results monthly
The information given in this summary is necessarily incomplete and is provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.	

Site Name	Hallenbeagle	NGR	172714, 044783
Site Address	Redruth TR16 5BN	Site area (ha.)	**3.04**

1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by SUEZ Recycling and Recovery UK Ltd on behalf of Cornwall Councill (the Client) to carry out a Phase 2 Geo-environmental Site Investigation (Planning Phase) of the land at Hallenbeagle, Redruth TR16 5BN. The project was carried out to an agreed brief as set out in RSK's proposal (Ref. T315111, dated 21st April 2022).

RSK's service constraints are shown in Appendix A.

The Site in question is being considered for development for commercial use.

1.2 Objectives

The objective of the work is to establish the current condition of the site with respect to:

- Risks to sensitive receptors from potential contamination sources
- Remediated mining features and the accuracy of the associated mining report.

1.3 Scope of works

The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance.

The scope of the intrusive investigation has been designed in line with the recommendations of BS5930:2015+A1:2020 Code of practice for ground investigations (BSI, 2020), which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. It has also been developed in general accordance with BS 10175: 2011 + A2 2017. Ground gas assessment has been undertaken in general accordance with BS8576: 2013 and BS 8485:2015+A1:2019.

A brief summary of relevant legislation and policy relating to land contamination is given in Appendix C.

The scope of works for the assessment has included the following:

Intrusive Investigation

- design and implementation of an intrusive investigation, in situ testing, soil sampling, laboratory geo-environmental, groundwater and ground gas monitoring of installed boreholes
- interpretation of data to develop a refined conceptual site model (CSM)
- generic quantitative risk assessment (GQRA) of relevant contaminant linkages

- preliminary assessment of the potential waste classification
- preparation of this factual and interpretative report.

1.4 Existing reports

The following reports detailing previous works at the site were made available for review:

Mining and Contamination Reports:

- RSK Geosciences, Phase 1 Desk Study: Suez, Hallenbeagle, Redruth TR15 5BN, Reference 315111 R01 (02), July 2022.
- Crofty Consultancy Environment and Mining Services, Cornwall Food and Energy Park, Hallenbeagle Geo-environmental Report, Reference: 18045, 26th October 2007
- Cornwall Mining Services Ltd, Proposed Eco Park & Gypsy Relocation Sites Hallenbeagle NR Scorrier Redruth Cornwall, Reclamation Strategy, Reference: 4962.Rec.Str, 3rd February 2011.
- Mining Searches UK, Proposed Bio-park land at Hallenbeagle (east), Scorrier, Cornwall, Further Soils analysis report, Reference 54785.FSA.11th March 2013.
- Mining Searches UK, Mining Site Investigation and Securing report for proposed industrial development land at Hallenbeagle (east), Scorrier, Cornwall, Reference 54785.sir, 2nd May 2014
- Cornwall Consultants Ltd, Regulated Mining Search: Metalliferous Minerals, ref: JW/CMS/129874, 06 March 2020.

Ecology Reports

- Spalding Associates (Environmental) Ltd, Japanese Knotweed at Hallenbeagle, September 2007.
- Cormac Contracting Ltd, Cornwall Biopark, Hallenbeagle Estates Ltd, Japanese Knotweed Report, Ref no 1203C028.IJN/JKW001, 15th April 2013
- Cormac Solutions Ltd, Invasive Plant report, Survey of Japanese Knotweed, commercial building plot at Hallenbeagle, Cormac ref 146/JKSR/27.03.18, 3rd April 2018.

Pertinent information from these reports has been summarised in Section 2.

1.5 Limitations

This report is subject to the RSK service constraints given in Appendix A and limitations that may be described through this document.

2 SITE DETAILS

2.1 Site location

Site location details are presented in Table 1 and a site location plan is provided on Figure 1.

Table 1 Site location details

Site name	Hallenbeagle
Full site address and TR16 5BN	Land at Hallenbeagle, Scorrier, Redruth, Cornwall, TR16 5BN
National Grid reference (centre of site)	172714, 044783

2.2 Site description

The Site boundary and current site layout are shown on Figure 2. The site is known to have been previously remediated for mining features across an area of c. 3.04 hectares. The site is now disused and remains unoccupied, although there's evidence to suggest it was used by travellers in the past. Most notable features on site include a gentle slope towards the south, sparse vegetation and occasional stockpiling of unknown soils. A railway embankment is located along the western site boundary (running NE-SW) with the Paddington to Penzance mainline at the toe and the former Hallenbeagle engine house is located immediately off the southwest site boundary.

2.3 Surrounding land uses

The site is located in Scorrier, near Redruth, within a predominantly commercial/ industrial setting. Immediate surrounding land uses are described in Table 2.

Table 2 Surrounding land uses

North	Railway line, Blackwater Bypass A30, Sawmills Cottage and fields
East	Sawmills Lane, Cormac Solutions Depot and fields
South	Sawmills Lane, fields and Carrs Land Rover Jaguar
West	Railway Line, Carrs Land Rover Jaguar and Blackwater Bypass A30

2.4 Development plans

The proposed layout of the site, at the time of preparing this report, is shown in Appendix B.

The site is intended for commercial end use comprising a new refuse transfer station (RTS) and material recycling facility with associated infrastructure and offices. The majority of the site will be covered with hardstanding and buildings. A small area of soft

landscaping is proposed at the north eastern corner of the site in addition to an area to be retained along the western boundary adjacent to the railway cutting where the current ecological exclusion zone exists.

.

3 SITE INVESTIGATION STRATEGY & METHODOLOGY

3.1 Introduction

RSK carried out intrusive investigation works and subsequent monitoring of boreholes between July 2022 and August 2022.

3.2 Objectives

The specific objectives of the investigation were as follows:

- to establish the ground conditions underlying the site including the extent and thickness of made ground and remedial fill
- to identify previous mine shaft locations and remedial capping
- to investigate specific potential sources of contamination identified in initial CSM
- to determine infiltration rates of soils
- to determine groundwater depth and flow direction
- to determine the ground gas regime underlying the site

3.3 Selection of investigation methods

The techniques adopted for the investigation were chosen with consideration of the objectives and site constraints, which are described below.

Mechanically excavated trial pits were carried out for the combined purpose of in-situ testing, obtaining environmental and geotechnical soil samples and to identify the locations of previous mining shaft locations and remedial capping. Environmental soil samples were also acquired from within hand dug trial holes across the existing stockpiles.

Open hole rotary drilling was chosen based on the targeted drill depth to install monitoring wells within proximity of proposed infiltration features.

Prior to conducting intrusive works, utility service plans were obtained and buried service clearance undertaken in line with RSK's health and safety procedures. Copies of statutory service records obtained by RSK as part of the agreed scope of works are contained in Appendix F.

3.4 Investigation strategy

The ground investigation was carried out using intrusive ground investigation techniques in general accordance with the recommendations of BS5930:2015+A1:2020, which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. Whilst every attempt was made to record full details of the strata encountered in the exploratory holes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

The investigation strategy involved targeted trial pits and boreholes on the areas of proposed infiltration features, stockpiled material and previous mining features.

The constraints to the investigation were as follows:

- Underground services
- Stockpiles located in the southeast corner
- Network rail and ecology exclusion zones along west site boundary

Details of the investigation locations, installations and rationale are presented in Table 3. 25no. machine excavated trial pits were dug to a maximum depth of 5.20 m bgl before being backfilled with arisings. 3no. hand dug trial holes were dug to a maximum depth of 0.90 m bgl. 2no. open hole rotary boreholes were drilled to a maximum depth of 5.00 m bgl each was installed with a combined gas and groundwater monitoring well. An exploratory hole location plan is shown on Figure 3

Table 3 Exploratory hole and monitoring well location rationale

Investigation type	Number	Designation	Monitoring well installation	Rationale examples below
Rotary open hole.	2	BH01 to BH02	Gas and groundwater	To install monitoring wells within proposed infiltration features.
Trial-pits excavated by mechanical excavator	6	TP01A, TP01B, TP02, TP03, TP14, TP15	n/a	To determine the infiltration rate of the soil.
Trial-pits excavated by mechanical excavator	19	TP05, TP06, TP07, TP08, TP09, TP10, TP11, TP12, TP13, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25	n/a	To identify the geological succession beneath site, take environmental soil samples and identify remediated mining features.
Trial- pits excavated by hand	3	HP01, HP02, HP03	n/a	To obtain WAC samples within existing stockpiles.

3.4.1 Implementation of investigation works

The exploratory holes were logged by an engineer in general accordance with the recommendations of BS5930:2015+A1:2020 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1)..

The monitoring well construction and associated response zones are detailed on the exploratory hole records in Appendix E. The response zones were installed to target groundwater.

The soil sampling and analysis strategy was designed to characterise each encountered soil strata, permit an assessment of the potential contaminant linkages identified and investigate the geotechnical characteristics. In addition, samples were taken to allow for geo-environmental testing to be undertaken.

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite required. They were dispatched to the laboratory in cool boxes under chain of custody documentation. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

Selected samples were placed in polythene bags for headspace screening with a photo-ionisation detector (PID) fitted with a 10.6 eV bulb. The PID screening results are presented on the exploratory hole records.

3.5 Monitoring programme

3.5.1 Ground gas monitoring

In line with the initial CSM, response zones were installed to target the sources or pathways.

The first round of monitoring was undertaken on August 2nd 2022, to provide data to support refining of the CSM. A further five rounds are due to be undertaken on a monthly basis.

A calibrated infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO_2), methane (CH_4) and oxygen (O_2) in percentage by volume, while hydrogen sulphide (H_2S) and carbon monoxide (CO) were recorded in parts per million.

The atmospheric pressure before and during monitoring, together with the weather conditions, were recorded. The monitoring included periods of falling atmospheric pressures and after/during rainfall.

All ground gas monitoring results together with the temporal conditions are contained within. Equipment calibration certificates are available on request.

3.5.2 Groundwater monitoring

The first round of monitoring was undertaken on August 2nd 2022. A further five rounds are due to be undertaken on a monthly basis.

The monitoring records, including dates, are shown in Appendix G.

Depths to groundwater were recorded using an electronic dip meter on the monitoring visit.

3.6 Laboratory testing

Laboratory testing was undertaken at a UKAS accredited laboratory with ISO17025 and MCERTS accredited test methods were specified where applicable for contamination testing and as shown in the laboratory test certificates appended.

3.6.1 Chemical analysis of soil samples

The soil sampling strategy was designed to characterise made ground typically within the upper 1.00 m of the ground profile whilst also characterising deeper strata and the potential for contaminant migration from relevant sources of identified within the preliminary CSM.

The programme of chemical tests undertaken on soil samples obtained from the intrusive investigation is presented in Table 4 with the laboratory testing results contained in Appendix H.

Table 4 Summary of chemical testing of soil samples

Stratum	Tests undertaken	No. of tests
Made Ground	WAC - E	6
	Metals, speciated PAHs, asbestos screen with ID, Hex chromium, total organic carbon	19
	TPH CWG	4
	Total TPH with ID	5
Weathered Porthtowan Formation	Metals, speciated PAHs, asbestos screen with ID, Hex chromium, total organic carbon	2
	TPH CWG	1
	Total TPH with ID	1

3.6.2 Infiltration testing

Infiltration tests were carried out in trial pits, TP01B, TP02, TP03, TP14 and TP15 to establish the infiltration rate of the underlying strata. The tests were carried out generally in accordance with the method described in BRE Digest 365 (BRE, 2016). This involved filling the pits with water from a tanker and recording the drop in water level with time as the water soaked into the ground.

Copies of the testing records are included in Appendix L.

4 SITE INVESTIGATION FACTUAL FINDINGS

The results of the intrusive investigation and subsequent geo-environmental laboratory analysis undertaken are detailed below.

4.1 Ground conditions encountered

The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater, in-situ testing and details of monitoring well installations are included on the exploratory hole records presented in Appendix E.

The exploratory holes revealed that the site is generally underlain by a variable thickness of compacted made ground over the weathered Porthtowan Formation. In localised areas of remediated mining features, the area was underlain by two types of heavily compacted made ground (fill) over concrete.

For the purpose of discussion, the ground conditions encountered during the fieldworks are summarised in Table 5 with the strata discussed in subsequent subsections.

Table 5 General succession of strata encountered

Stratum	Exploratory holes encountered	Depth to top of stratum m bgl	Proven thickness (m)
Topsoil	BH1, BH2, TP01A, TP01B, TP02, TP03, TP04, TP08, TP09, TP10, TP11, TP12, TP13, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25	0.00	0.05 - 0.30
Stockpiled Material	HP01, HP02, HP03	0.00	0.90
Made Ground (1)	BH1, BH2, TP01A, TP01B, TP02, TP03, TP04, TP05, TP06, TP08, TP09, TP11, TP12 TP13,TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25	0.00 - 0.30	0.40 – 2.3
Made Ground (2)	TP18, TP20, TP23, TP25	2.00 - 2.70	0.75 - 2.50
Concrete	TP20, TP21, TP23, TP25	1.80 – 5.20	NA
Weathered Porthtowan Formation	TP01B, TP03, TP04, TP05,TP07, TP08, TP09, TP10, TP11, TP12, TP13,TP14, TP15, TP16, TP17, TP19, TP22, TP24,	0.30 - 2.60	0.70 - 4.50 (base of trial pit)

4.1.1 Topsoil

Topsoil was generally 0.3 m thick across site and was comprised of either a clayey GRAVEL or gravelly SILT.

4.1.2 Stockpiled Material

The material encountered across all three stockpiles was comprised of a brown slightly gravelly sandy SILT including slate, ceramic, quartz and igneous rock.

4.1.3 Made Ground (1)

Compacted Made Ground (1) was generally encountered beneath topsoil in a majority of trial pits and boreholes across the site, comprising silty/clayey GRAVEL with variably low to high cobble content. A range of anthropogenic materials were encountered within this stratum group, including a rubber tyre, plastic (bottles), textile/cloth, ceramic, glass, wood, tarmac, metal, barbed wire, concrete, reinforcement bars, disused wiring and cables. This stratum ranged in thickness from 0.40 m to 2.30 m.

4.1.4 Made Ground (2)

Made Ground (2) was a distinct, uniform layer of coarse granular material encountered at depths of between 2.00 mbgl and 2.70 mbgl, with a maximum thickness of 2.50 m, in trial pits 18, 20, 23 and 25. This material represents a layer of the compacted, engineered fill used to remediate mining features across site. This material included yellow brown gravelly COBBLES comprised solely of igneous rock.

4.1.5 Concrete

The surface of concrete plugs used to remediate mining features were encountered in TP20, TP21, TP23 and TP25 at depths of between 1.80 to 5.20mbgl. Excavation was carried out in a careful and controlled manner to avoid damaging the structural integrity of the material.

4.1.6 Weathered Porthtowan Formation

Natural soil was encountered at depths of between 0.30-2.60 mbgl and comprised a reddish brown slightly silty sandy GRAVEL of metamudstone and metasandstone with variably low to high cobble content and occasional boulders. TP11, TP12 and TP13 located on the mid-western portion of site encountered significant layers of silty/sandy gravelly CLAY with a higher cobble content. Whereas TP11, TP12 TP14 and TP15 incorporated clay only as a secondary component or as smaller isolated pockets within a predominantly granular soil.

4.1.7 Visual/olfactory evidence of soil contamination

Anthropogenic materials were encountered in the Made Ground of BH1, TP02, TP04, TP05, TP08, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24 and TP25. These materials include: a rubber tyre, plastic (bottles), textile/cloth, ceramic, glass, wood, tarmac, metal, barbed wire, concrete, reinforcement

bars, disused wiring and cables. Trial pits 14, 20 and 21 contained higher proportions of anthropogenic materials compared to others.

There was no significant olfactory evidence of contamination within made ground deposits and underlying natural strata.

Subsequent testing of environmental samples using a Photo Ionisation Detector (PID), suggest a broad absence of VOC's in Made Ground material.

4.2 Groundwater and surface water

4.2.1 Groundwater encountered during intrusive works

Groundwater was not encountered during the investigation works or subsequent monitoring.

4.3 Chemical laboratory results

The soil testing results are presented in Appendix H.

Chrysotile fibres of asbestos was detected in two out of nine samples tested.

4.4 Ground gas monitoring

The results of the ground gas monitoring and testing carried out are given in Appendix G and discussed in section 5.

5 GEO-ENVIRONMENTAL ASSESSMENT

5.1 Refinement of initial CSM

Made Ground was confirmed across the site at all positions, generally comprising a silty/clayey GRAVEL with variably low to high cobble content. All PID readings were 0.0ppm and significant contamination was not encountered within the investigation locations.

As expected, the Made Ground was thicker above remediated mining features. Although trial pits TP20 and TP21 contained unexpectedly substantial amounts of anthropogenic materials within the Made Ground

Groundwater was not encountered during the investigation. On the first monitoring round BH1 and BH2 were also found to be dry.

The PRA identified the following potentially complete contaminant linkages for further investigation with a risk of moderate to low or higher:

- Future site users – site workers [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust, inhalation of vapours from groundwater
- Groundwater in secondary A aquifer within the Porthtowan formation bedrock deposits [percolation through permeable strata to aquifer)
- Future buildings and services (potable water supply) [direct contact with contaminated soils or groundwater and chemical attack]

5.2 Linkages for assessment

As described in LCRM (Environment Agency, 2021), there are two stages of quantitative risk assessment (QRA), Tier 2 generic (GQRA) and Tier 3 detailed (DQRA). The GQRA comprises the comparison of soil, groundwater, soil gas and / or ground gas results with generic assessment criteria (GAC) that are appropriate to the linkage being assessed. This comparison can be undertaken directly against the laboratory results or following statistical analysis depending upon the sampling procedure that was adopted. This assessment relates to LCRM Stage 1, Tier 2 generic quantitative risk assessment

Following the refinement of the CSM, the potentially complete contaminant linkages that require further assessment and the methodology of assessment are presented in Table 6.

Table 6 Linkages for GQRA

Potentially relevant contaminant linkage	Assessment method
Human health and phytotoxic-related linkages	
H1. Oral, dermal and inhalation exposure with impacted soil, soil vapour and dust by future site users	Commercial use GAC in Appendix O for a proposed commercial end use. Consideration given to the applicability of the use of Statistical Assessment.

Potentially relevant contaminant linkage	Assessment method
H2. Inhalation exposure of future site users to asbestos fibres	Qualitative assessment based on the asbestos minerals present, their form, concentration, location and the nature of the proposed development.
H3. Organic contaminants permeating potable water supply pipes	Comparison of soil data to GAC in Appendix Q for plastic water supply pipes using UKWIR (2010) guidance.
Controlled waters-related linkages	
W1. Leaching of soil contaminants and dissolved phase migration to wider secondary aquifer	Since no leachate data is available and groundwater has not been encountered, the potential risk to controlled waters has been considered qualitatively using soil results.

5.3 Methodology and assessment of human health and phytotoxic-related linkages

5.3.1 H1. Oral, dermal and inhalation exposure with impacted soil by future site users

In order to assess the soil results against the appropriate GAC, the soil results have been split into appropriate data sets relevant to the oral, dermal and inhalation linkage.

The datasets being considered in the assessment are:

- data set 1 Made Ground
- data set 2 Weathered Porthtowan Formation

As an initial assessment of each dataset, all soil results in each dataset have been directly compared against the GAC for commercial end use.

The ratio of soil contaminant concentrations of genotoxic PAHs (benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(ah)anthracene, indeno(123-cd)pyrene and benzo(ghi)perylene) against benzo(a)pyrene have been compared against lower and upper limits set out in C4SL project methodology (CL:AIRE, 2014). All genotoxic PAH ratios were within the upper and lower bounds of the underlying toxicological study. Therefore, and in accordance with HPA guidance (HPA, 2010), the assessment of genotoxic PAHs has been based on the use of benzo(a)pyrene as a surrogate marker. Therefore, a risk from genotoxic PAHs is only considered likely if the respective benzo(a)pyrene concentrations exceed the relevant GAC.

5.3.1.1 Data set 1 – Made Ground

All made ground results have been compared with the commercial end use GAC. A soil organic matter (SOM) of 2.5 % has been selected since laboratory results within the made ground range from 0.19% and 4.60%. The soil screening output spreadsheet is presented as Appendix K.

Assessment of the results indicates exceedances of the GAC for the contaminants shown in Table 7. These are highlighted in red on the screening output spreadsheet in Appendix K.

Table 7 Data summary table – Data set 1

Determinand	No. of samples tested	GAC (mg/kg)	No of exceedances	Maximum concentration (mg/kg)	
				Value	Location / depth (m bgl)
Arsenic	19	640	6	11400	TP14 - 0.50m bgl

5.3.1.2 Data set 2 – Weathered Porthtowan Formation

Results indicate that all contaminants are below the relevant GAC therefore it is considered that a relevant contaminant linkage does not exist.

5.3.1.3 Summary

On the basis of the above assessment it is considered that there is some potentially significant risks associated with arsenic in the Made Ground.

However the majority of site is understood to be hard covered (buildings and hard surfacing), with only one small area of managed soft landscaping on the north eastern corner to site. Therefore, across the majority of the site the potential contaminant linkage (direct contact by future site users with contaminants in the Made Ground) will be mitigated by the presence of hardstanding.

For the area of soft landscaping in the north eastern corner it is recommended that a suitable cover system is installed in line with an agreed Remedial Strategy.

The area of retained soft landscaping within the ecological exclusion zone along the western boundary was not tested.

Based on the above assessment, no potentially significant risks have been identified for natural soils derived from the Porthtowan Formation.

5.3.2 H2. Inhalation exposure of future site users to asbestos fibres

The laboratory screening for asbestos identified detectable asbestos fibres within two samples of Made Ground (TP04 and HP03). These samples were then further analysed and the presence of fibres of chrysotile were confirmed with quantifiable volumes of 0.005% and <0.001% respectively.

The majority of site is understood to be hard covered (buildings and hard surfacing), with only one small area of managed soft landscaping on the north eastern corner to site. Therefore the potential contaminant linkage (release of asbestos fibres with the potential for inhalation) will be mitigated by the presence of hardstanding and cover system as previously discussed.

Due consideration will however need to be given to future groundworkers and the status of the material under the Control of Asbestos Regulations (CAR:2012). Depending on the build programme and risk of disturbance of the impacted material, it may be prudent to consider removing from site as part of the enabling works.

5.3.3 H3. Organic contaminants permeating potable water supply pipes

For initial assessment purposes, the results of the investigation have been compared with the GAC presented in Appendix J for this linkage, which are reproduced from *UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (UKWIR, 2010).

The results indicate that a relevant linkage is unlikely to exist associated with organic contaminants and therefore pollutant polyethylene (PE) and/or polyvinyl chloride (PVC) water supply pipes are expected to be suitable for use on the development.

It should be noted that at the time of this investigation the future routes of water supply pipes had not been established, hence the investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling/analytical strategy may be required at a later date once the route(s) of the supply pipe(s) are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

5.3.4 W1. - Leaching of soil contaminants and dissolved phase migration to wider secondary aquifer

Whilst elevated concentrations of metals were encountered by the testing, this is considered likely to be indicative of the mining heritage of the site and wider regional area and hence is not considered to be significant with respect to controlled waters impact. Organic compounds were not found to be significantly elevated.

Further to the above, groundwater was not encountered during the investigation or subsequent monitoring albeit further visits are scheduled.

Based on the above it is considered that a viable contaminant linkage is unlikely to be present with respect to controlled waters.

5.4 G1: Methodology and assessment of ground gas-related linkages

5.4.1 Appropriate guidance

The risks to development from ground gases have been assessed in accordance with BS8485:2015+A1:2019 (BS8485), which provides guidance on ground gas (methane and carbon dioxide) characterisation and hazard assessment, as well as providing a framework for the prescription of protection measures within new buildings.

The process involves characterising the gas hazard from combining the qualitative assessment of risk (using the CSM) with ground investigation data so that a ‘characteristic

situation' (CS) can be derived for the site or zones within the site. Characteristic situations range from CS1 to CS6, the higher the CS, the higher the hazard potential. Gas protection measures within new buildings can be prescribed using a point scoring system, taking into consideration the CS and the proposed building type.

BS8485 indicates that the gas hazard can be characterised using the following methods:

- an empirical semi-quantitative approach using gas monitoring data to determine the 'characteristic situation' of the site (or zones of the site) and subsequent protective measures (Wilson and Card approach).
- an empirical semi-quantitative approach using TOC data to determine the 'characteristic situation' of the site (or zones of the site) and subsequent protective measures (CL:AIRE RB17 approach)
- detailed quantitative assessment methodologies

For the purpose of this assessment, the empirical semi-quantitative approach above has been used to characterise the gas hazard and provide advice on the protective measures likely to be required within new buildings at the site.

5.4.2 Summary of the refined CSM for ground gas

In the assessment of risks and selection of appropriate mitigation measures, BS8485 highlights the importance of the conceptual model. In summary, potential sources of ground gas within influencing distance of the site identified in section 6.2 comprise:

- Made Ground (1) with TOC varying between 0.11 to 2.67 % and thickness of up to 2.30 mbgl.

Pathways and receptors for ground gas were identified in Section 6.2.

This assessment has been undertaken to assess risks to building structures and proposed end users. The assessment has not taken into consideration the health and safety of construction workers. Risks may still be present to construction workers especially where works include the entry into excavations within the ground. Construction workers should undertake appropriate risk assessments and risks should be managed through health and safety procedures and safe systems of work.

The risk assessment has been undertaken based on the current understanding of the CSM.

5.4.3 Empirical semi-quantitative approach using borehole monitoring data (Wilson and Card approach, BS8485)

5.4.3.1 Background

The empirical semi quantitative approach using gas monitoring data requires the designation of a gas screening value (GSV) for the entire site or zones within the site, which informs the hazard potential and associated prescribed ground gas protection measures within new buildings (where necessary). BS8485 defines the GSV as the *'flow rate (l/hr) of a specific hazardous gas* ***representative of a site or zone****, derived from assessment of borehole concentration and flow rate measurements and taking account of all other influencing factors, in accordance with a conceptual site model'.*

BS8485 Section 6.3.1 outlines the process for developing a GSV for the site or a zone as follows:

- borehole hazardous gas flow rate (Q_{hg}) is calculated for each borehole standpipe for each monitoring event. The borehole hazardous gas flow rate is defined in BS8485 as the '*flow rate of a specific hazardous gas, either methane or carbon dioxide, from a borehole standpipe'*. The Q_{hg} is calculated from individual borehole measurements of total gas flow and the concentration of the specific hazardous gas. BS8485 states in Section 6.3.4 that the **maximum** gas concentration recorded during the monitoring event should be used, together with **steady-state** values of gas flows
- the reliability of the measured gas flow rates and concentrations are assessed taking into account borehole construction
- decisions are made about how to deal with any temporal or spatial shortages in the data
- judgements are made about what GSV to designate for use for design purposes taking all relevant information and the conceptual site model into account.

Once the Q_{hg} has been calculated for methane and carbon dioxide, individual borehole measurements are compared to the thresholds presented in Table 2 of BS8485 which inform the CS that directly relates to each individual measurement. Taking into account the site data (i.e. borehole gas concentration and flow rate to calculate the Q_{hg}) and all other influencing factors in accordance with the CSM, a decision can then be made regarding the GSV that is considered to be representative of the site or a zone within it.

Typical threshold concentrations of methane (1% v/v) and carbon dioxide (5% v/v), and flow rates (>70 l/h), are also considered when designating the GSV for the site or zone, which in turn dictates the hazard potential and CS. It is important to note that the site or zone characteristic GSV and maximum concentration or flow thresholds are guideline values and not absolute. The thresholds may be exceeded in certain circumstances, if the CSM indicates it is safe to do so.

5.4.3.2 Designation of a GSV for the site or zone

The results of the initial ground gas monitoring and testing undertaken, alongside site conditions at the time of monitoring, are given in Appendix G.

Consideration has been given to the presence of flooded or partially flooded response zones at the time of monitoring, with details of fully or partially flooded response zones detailed in Appendix G.

A summary of the maximum recorded concentrations per borehole (or minimum for oxygen) is presented in Table 8 overleaf. This table also presents details of the response zone, maximum recorded initial and steady state flow rates and minimum recorded depth to water for the initial monitoring round.

The atmospheric pressure during the initial monitoring round was 1004 mbar.

Table 8 Summary of ground gas monitoring results

Exploratory position ID	Response zone top (mbgl)	Response zone base (mbgl)	Response zone geological unit	Number of monitoring rounds	Peak methane max (%/vol)	Steady-state methane max (%/vol)	Peak carbon dioxide max (%/vol)	Carbon dioxide steady-state max (%/vol)	Oxygen min (%/vol)	Peak gas flow max (l/hr)	Steady-state gas flow max (l/hr)	Depth to water min (m)	Depth to water max (m)	Atmospheric pressure min (mb)	Atmospheric pressure max (mb)
BH1	2	4.62	Porthtowan Formation	1	0	0	6.1	6.1	16.2	0	0	DRY	DRY	1004	1004
BH2	2	4.72	Porthtowan Formation	1	0	0	4.2	4.1	17.6	0	0	DRY	DRY	1004	1004

5.4.3.3 *Summary of borehole hazardous gas flow rates*

Borehole hazardous gas flow rates (Q_{hg}) have been calculated for each borehole standpipe, for each monitoring round and are presented, alongside two 'worst case' checks in Appendix M comprising a probable 'worst case' and potential 'worst case' from the available monitoring data. Within this data gas concentrations exceeding the thresholds presented in Table 2 of BS8485 are identified, alongside the CS that could be associated with each individual borehole monitoring event.

The maximum CS associated with each borehole was CS1.

5.4.3.4 *Worst case check*

In accordance with BS8485, a 'worst case' Q_{hg} has been calculated per borehole by multiplying the maximum recorded flow from any monitoring round for that borehole by the maximum recorded methane or carbon dioxide concentration in that borehole. A further worst-case Q_{hg} check across all data collected is presented in Appendix M for the entire site (or zone), which has been calculated by multiplying the maximum recorded flow by the maximum recorded methane or carbon dioxide concentration.

The worst case check calculated a maximum Q_{hg} of 0% for both methane and carbon dioxide based on a maximum concentration of 0% for methane and 6.1% for carbon dioxide with a maximum flow of 0 litres/hour.

5.4.3.5 *Consideration of negative flow rates*

No negative flows were encountered during the initial monitoring round.

5.4.3.6 *Designation of site gas screening value (GSV)*

Based on the Q_{hg}, the maximum concentrations and flows recorded, the CSM and the method for determining the CS presented within Table 2 of BS8485, the site has been characterised as CS1.

It is noted that the initial round recorded CO2 in excess of 5% whereby it is recommended that a higher CS is considered. Any consideration is an evidence based approach drawing on the findings of the CSM, observations on site and sensitivity of the proposed development. Based on the evidence to date, CS1 is considered appropriate albeit this will be subject to review as monitoring progresses.

5.4.3.7 *Data Limitations*

It should be noted that there are inherent limitations in ground gas monitoring including spatial adequacy of monitoring locations, changes in groundwater levels, variation in temporal or atmospheric conditions and whether these have been adequately characterised by the scope of monitoring undertaken.

5.4.3.8 *Trace gases*

Hydrogen sulphide, carbon monoxide and VOCs were not detected.

5.4.4 BS8485 recommended ground gas protection measures

Based on the current understanding of the conceptual site model and the assessment undertaken, the site has been classified as CS1. Considering the foregoing and in accordance with BS8485, ground gas protective measures are not considered necessary within proposed buildings.

5.4.5 Implications of ground improvement or foundation design

Slab foundation types are being considered for the development. Where such works may create preferential pathways for ground gas migration to the surface, this needs to be considered through the design process, such as through a foundation works risk assessment.

Should foundation solutions or building design change within the design process, then this gas risk assessment and mitigation should be reviewed and where applicable updated.

5.5 Uncertainties and implications in refined CSM and GQRA

In accordance with good practice, data gaps and uncertainties in the refined CSM have been identified at this stage. These are summarised in Table 9 along with the likely implications.

Table 9 Data gaps and uncertainties

Data gap/ uncertainty	Details	Implications
Only 1 round of groundwater monitoring completed to date	There may be seasonal variations in water levels that could affect the direction of groundwater flow or migration pathways	Further groundwater monitoring and/or sampling may be needed over a longer time period to assess such effects
Ground gas monitoring has not included periods of falling atmospheric pressure	The worst case conditions for gas flow are unlikely to have been characterised, limiting the risk assessment.	The likely worst case gas regime has not been used and thus ground gas mitigation measures may be underestimated without further ground gas monitoring during a period of falling pressure

6 MINING RISK REVIEW

6.1 Previous information

As reported in RSK's Phase 1 Desk Study, Mining Searches UK carried out remedial works at Hallenbeagle during 2014. The site was stripped, secured and reinstated. The mining features were infilled by compacted material and where feasible, secured by means of a mass concrete plug, in line with historical and present day securing practice.

According to Figures 8 and 9 in the Mining Searches UK Report 2014, the remedial infill was a primary layer of compacted backfilled 'as dug' material, followed by structural infill of 4" clean stone and concrete (C35 Class 4 sulphate resisting concrete or C10 lean mix concrete).

6.2 RSK findings

RSK has identified the primary layer at the majority of exploratory positions as Made Ground type (1), with a maximum thickness of 2.30 m. The full remedial sequence, representing locations of former mining features, can also be successfully matched with ground conditions encountered in up to five different locations including TP18, TP20, TP21, TP23 and TP25 , as shown in Table 10.

The Mining Remediation Plan, as provided by the Client, indicates the presence of a large diameter shaft (F097) towards the north western corner of the development area. After plotting out the GPS coordinates on site, it appears to be located a few metres beyond the site boundary and is therefore unlikely to have a significant impact on the proposed development. To ensure the shaft did not encroach onto site, TP16 was dug as close to the position as was safely permitted and as expected, did not reveal any evidence for remediate mining features.

Table 10 Remedial Infill

Stratum Equivalent		Exploratory holes encountered	Depth to top of stratum m bgl	Proven thickness (m)
RSK Phase 2 investigation 2022	Mining Searches UK Report 2014			
Made Ground (1)	compacted backfilled 'as dug' material	TP18, TP20, TP21, TP23, TP25	0.00-0.30	0.40–2.3
Made Ground (2)	structural infill of 4" clean stone	TP18, TP20, TP23, TP25	2.00-2.70	0.75-2.50
Concrete	C35 Class 4 sulphate resisting concrete or C10 lean mix concrete.	TP20, TP21, TP23, TP25	1.80 –5.20	NA

Based on the ground conditions encountered above, the mining features appear to have been remediated as stated within the Mining Searches UK Report 2014 and as validated

at the time. Therefore it is considered unlikely that historical mining features pose a significant risk to the proposed development.

7 PRELIMINARY WASTE ASSESSMENT

In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if reused on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not become waste until the criteria above are met. Further background information is provided in Appendix H.

Excavation arisings from the development may therefore be classified as waste if surplus to requirements or unsuitable for reuse. The following assessments assume the material tested is classified subsequently as waste.

7.1 Hazardous waste assessment

Technical Guidance WM3 (EA, 2021) sets out in its Appendix C requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. The preliminary assessment provided below is based only upon the available sample results and may not be sufficient to adequately classify the waste.

7.2 Chemical contaminants

Envirolab, an RSK company, has developed a waste soils characterisation assessment tool (HASWASTE), which follows the guidance within Technical Guidance WM3. The analytical results have been assessed using this tool to assess the hazardous properties to support potential off-site disposal of materials in the future. Note that it is ultimately for landfills to confirm what wastes they are able to accept within the constraints of their permit.

The results are summarised in **Table 10** and presented in full in Appendix O.

Table 11 Results of waste soils characterisation assessment (HASWASTE)

Sample ref/ depth	Hazardous properties identified
TP01B (0.50m)	Yes - HP7 (carcinogenic)
TP03 (0.50m)	Yes - HP7 (carcinogenic)
TP14 (0.50m)	Yes - HP6 (acute toxicity) HP7 (carcinogenic)
TP04 (0.50m)	Yes - HP7 (carcinogenic) HP14 (ecotoxic)
BH2 (0.50m)	Yes - HP7 (carcinogenic)
HP03 (0.80m)	Yes - HP7 (carcinogenic)

The above samples representing Made Ground (1) are classified as having hazardous properties. This suggests that some of the waste may require disposal at a suitably permitted hazardous waste landfill. Asbestos within waste soils

Technical Guidance WM3 requires that within a mixed waste the separately identifiable wastes be assessed separately.

For instance, where waste soil contains identifiable pieces of asbestos (visible to the naked eye) the asbestos should, where feasible, be separated from the soil and classified separately. This should be disposed of within a hazardous, stable non-reactive hazardous waste landfill or a special cell in a non-hazardous waste landfill.

Visible asbestos containing material was not identified in the samples taken for analysis.

All samples were screened for asbestos and two samples (TP04 at 0.50m and HP03 at 0.80m) tested positive for Chrysotile loose fibres.

Samples have been analysed for percentage asbestos fibres by weight, the results of which are presented in Appendix H. Analysis confirmed that percentage of asbestos fibres is less than 0.1% by weight and therefore the waste can be disposed of within a non-hazardous waste landfill which is able to accept asbestos at non-hazardous concentrations.

7.3 WAC assessment

Samples from stockpile material: HP01 (0.40m & 0.80m), HP02 (0.50m & 0.80m) and HP03 (0.40m and 0.80m) were submitted for waste acceptance criteria (WAC) testing for WAC-E suite, the results of which are presented in Appendix H.

The results of the WAC testing indicate that the leaching limit values and criteria for hazardous waste have not been exceeded and therefore the waste is suitable for disposal at an appropriately licensed landfill. This does not take asbestos into account, however.

RSK recommends that a Sampling Plan be prepared to support any waste classifications and hazardous waste assessments, prior to any material being excavated. Given the level of data obtained, scale of the development and heterogeneity of the site soils, the following assessment should be considered indicative and further assessment should be undertaken following the preparation of a waste sampling plan

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Geo-environmental assessment

Based on the results of the site investigation and GQRA, the contaminant linkages that have been identified to be potentially complete (relevant contaminant linkages) and to require further action are:

• direct contact by future users with contaminants in the Made Ground

However the risk should be mitigated by the presence of hardstanding and installation of. a suitable cover system, in line with an agreed Remedial Strategy, across soft landscaping in the north east corner.

8.2 Drainage assessment

The infiltration rates derived from field data indicate that ground conditions towards the north are likely to be suitable for infiltration features. Infiltration test results for the south of the site were inconclusive and further testing in the south of the site is now underway. Results from these tests will follow.

8.3 Mining risk

As reported in RSK's Phase 1 Desk Study, Mining Searches UK carried out remedial works at Hallenbeagle during 2014. RSK can confirm the presence of remediated mining features on site. They are considered unlikely to pose a significant risk to the proposed development.

8.4 Recommendations

The following recommendations are made for further assessment of the site to investigate the risks identified above and to address remaining uncertainties:

- Additional infiltration testing in the area of the southern infiltration tank and foul soakaway is underway. Results from these tests will follow
- Additional groundwater monitoring rounds

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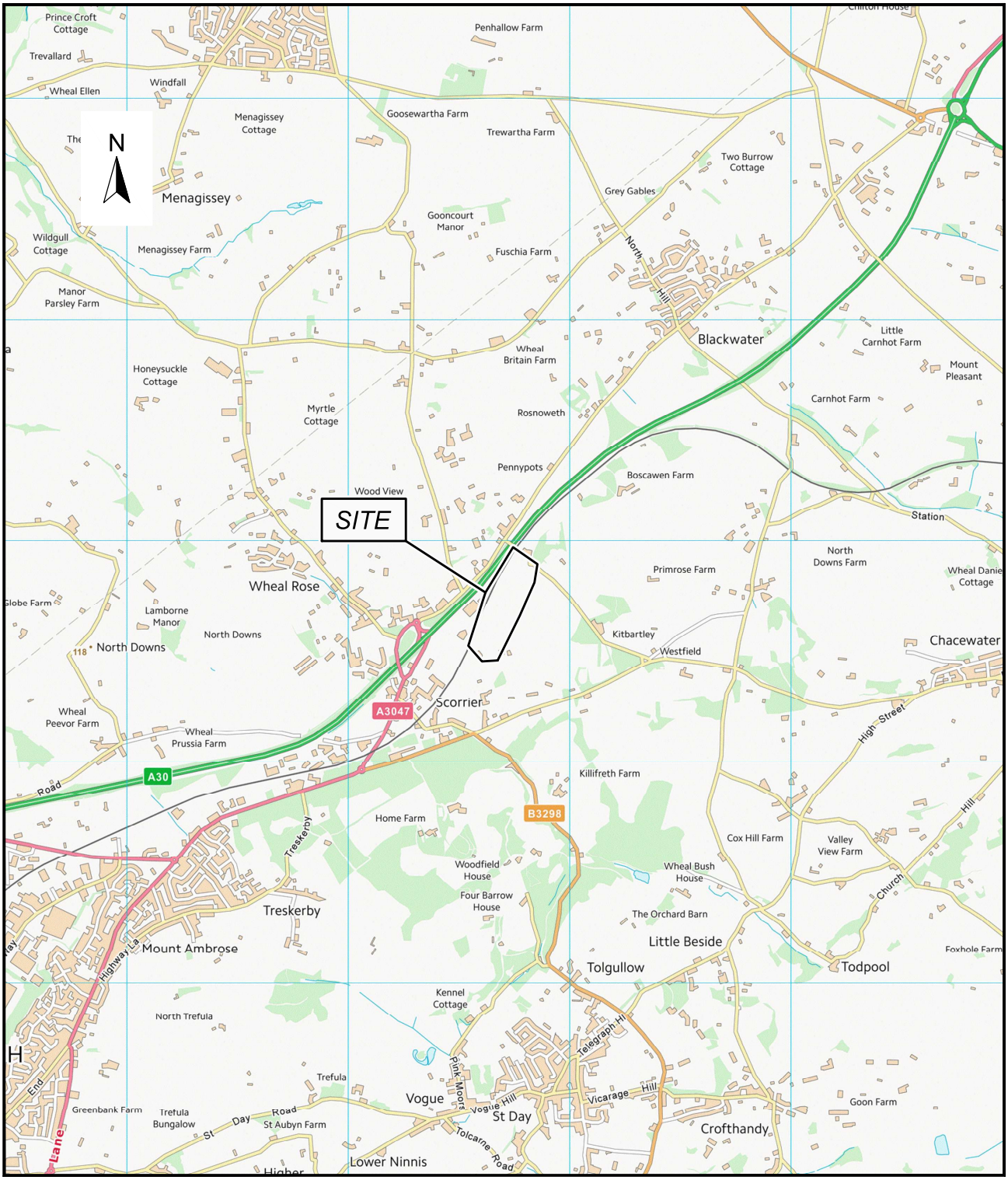
UK Water Industry Research, (2010), UKWIR Report 10/WM/03/21. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites.

FIGURES

FIGURE 1 SITE LOCATION PLAN



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Client: Suez

Project Title: Hallenbeagle

Drawing Title: SITE LOCATION MAP

Rev	Drawn	Date	Checked	Date	Approved	Date
00	MB	22.06.22	RL	22.06.22	-	-

Dimensions	Scale	Original Size
m	1:25,000	A4

Project Number	Grid Ref	Scale Bar	Drawing Number
315111	SW 727 447	0 250 500 750 1,000m	FIGURE 1

FIGURE 2 SITE LAYOUT PLAN

LEGEND

SITE BOUNDARY

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
00	22.06.2022	-	MB	RL	-

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Client: Suez

Project Title: Hallenbeagle

Drawing Title: SITE LAYOUT PLAN

Drawn	Date	Checked	Date	Approved	Date
MB	22.06.22	RL	22.06.22	-	-

Dimensions	Scale	Original Size
m	1:2000	A3

Project Number	Drawing Number
315111	Figure 2

Drawing File	Rev
315111 - FIG2 - REV00 - SLP	00

0 20 40 60 80 100m

FIGURE 3 EXPLORATORY HOLE LOCATION PLAN

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Project Title: Hallenbeagle

Drawing Title: Exploratory Hole Location Plan

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
00	19.08.22	FIRST ISSUE	MB	RL	-

Project Number: 315111

Drawing Number: Figure 3.1

Rev: 00

Dimensions: m

Scale: 1:600

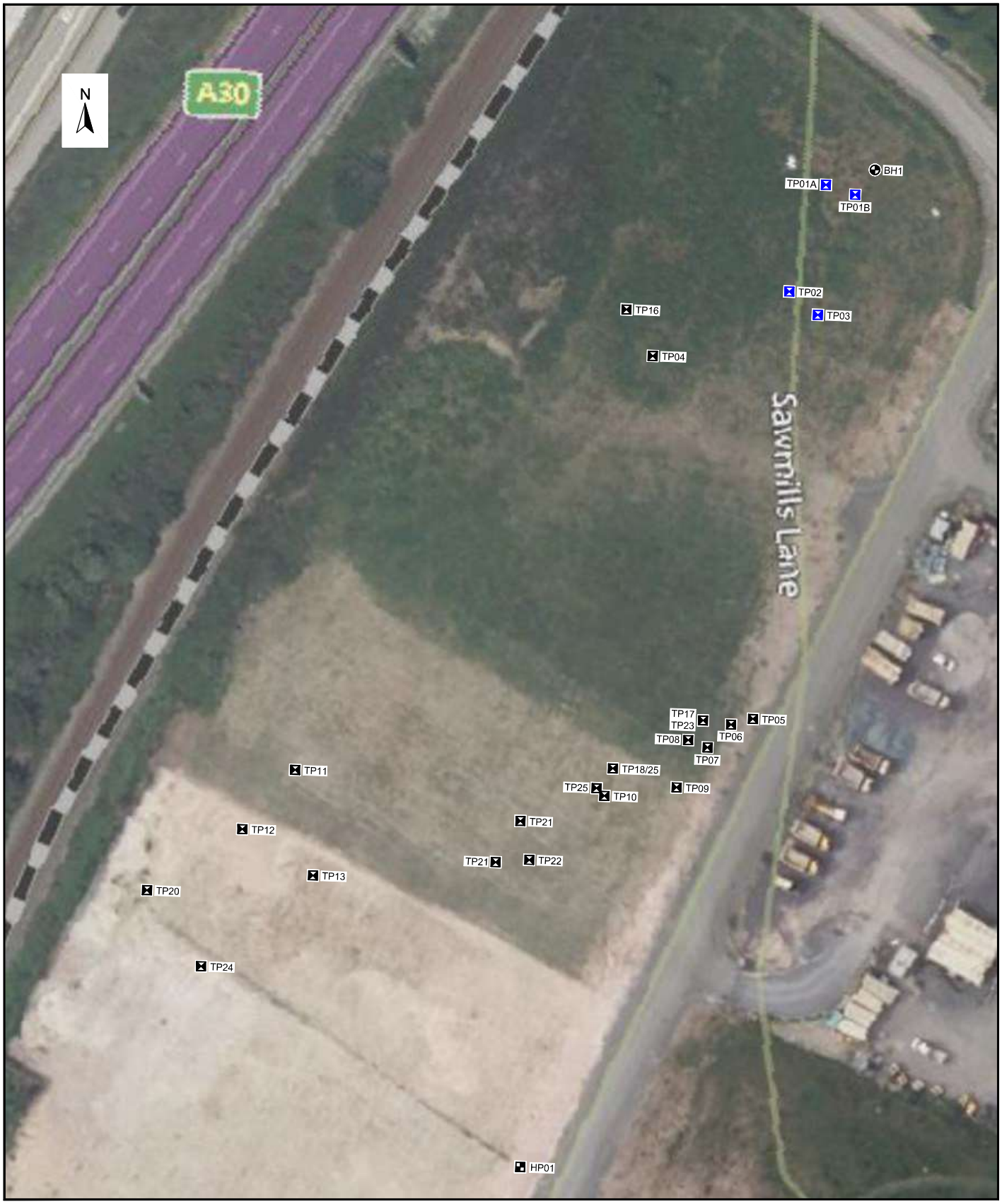
Original Size: A4

Drawing File: 315111 - FIG3.1 - REV00 - EHLP

0 5 10 15 20 25 30m

LEGEND

- Trial Pit Location
- Infiltration Testing Location
- Hand Dug Trial Pit Location
- Rotary Open Borehole Location



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Client: Suez

Project Title: Hallenbeagle

Drawing Title: Exploratory Hole Location Plan

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
00	19.08.22	FIRST ISSUE	MB	RL	-

Project Number: 315111

Drawing Number: Figure 3.2

Dimensions: m

Scale: 1:600

Original Size: A4

Drawing File: 315111 - FIG3.2 - REV00 - EHLP

0 5 10 15 20 25 30m

Rev: 00

LEGEND

- Trial Pit Location
- Infiltration Testing Location
- Hand Dug Trial Pit Location
- Rotary Open Borehole Location

APPENDICES

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Suez Recycling and Recovery UK Ltd (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client, dated 21st April 2022 The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS/ PFOS) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site,

unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.

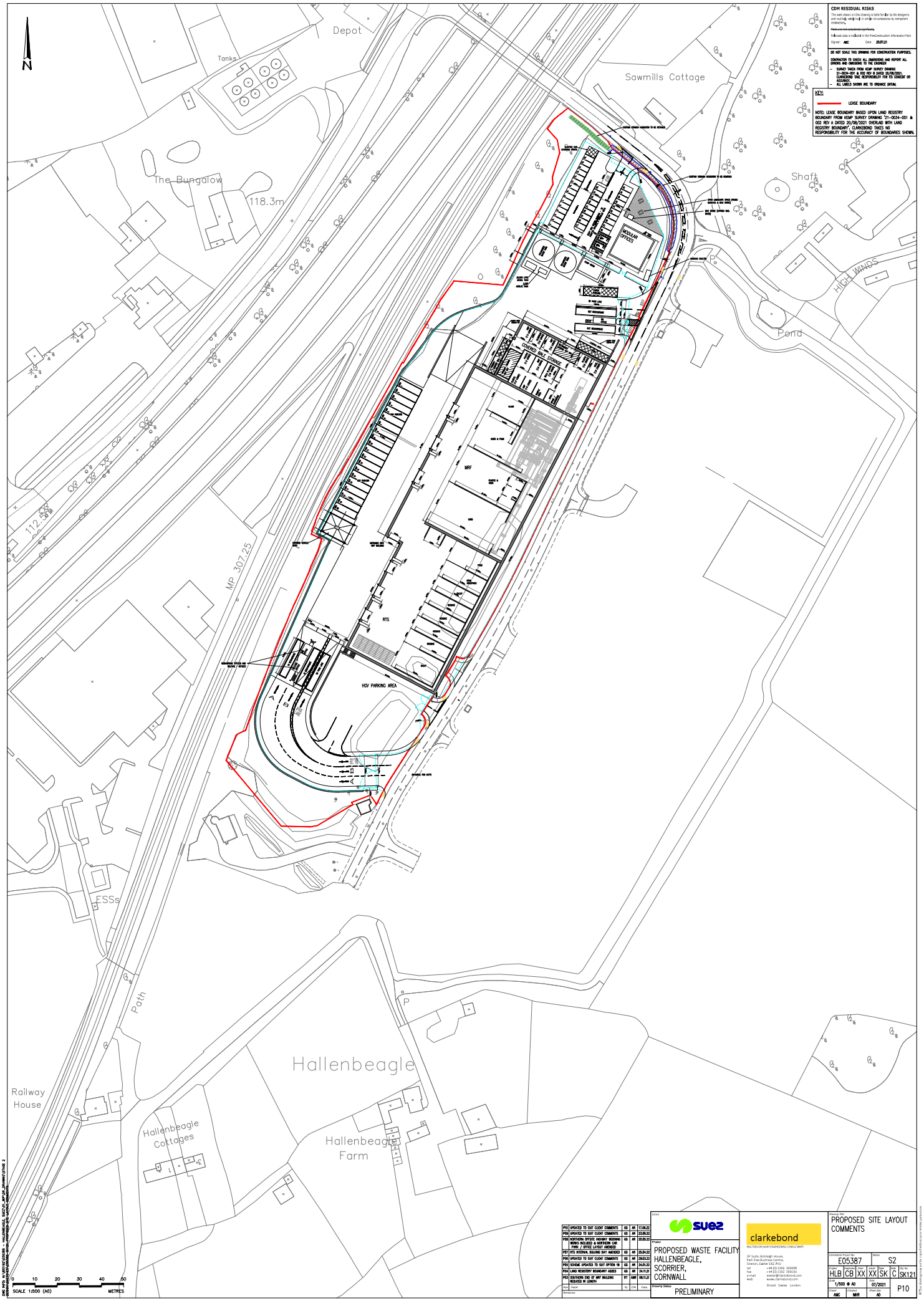
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.

12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B
DEVELOPMENT DRAWINGS



CDM RESIDUAL RISKS

The work shown on this drawing is believ fair to the designers and routinely safely built in similar circumstances by competent contractors.

~~Risks not considered significant.~~

Relevant data is included in the Pre-Construction Information Pack

Signed: AMC Date: 20.07.21

DO NOT SCALE THIS DRAWING FOR CONSTRUCTION PURPOSES.

CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER

- SURVEY TAKEN FROM KEMP SURVEY DRAWING 21-0034-3DV & 002 REV B DATED 20/08/2021. CLARKEBOND TAKE NO RESPONSIBILITY FOR TO CORRECT OR ACCURACY.
- ALL LEVELS SHOWN ARE TO ORDNANCE DATUM.

KEY:

LEASE BOUNDARY

NOTE: LEASE BOUNDARY BASED UPON LAND REGISTRY BOUNDARY FROM KEMP SURVEY DRAWING '21-0034-001 & 002 REV A DATED 20/08/2021 OVERLAID WITH LAND REGISTRY BOUNDARY'. CLARKEBOND TAKES NO RESPONSIBILITY FOR THE ACCURACY OF BOUNDARIES SHOWN.

P10	UPDATED TO SUIT CLIENT COMMENTS	GD	RT 17.06.22
P09	UPDATED TO SUIT CLIENT COMMENTS	GD	RT 23.05.22
P08	SOUTHERN OFFSITE HIGHWAY WORKS INCLUDED & NORTHERN CAR PARK / OFFICE LAYOUT AMENDED	GD	RT 20.05.22
P07	RTS INTERNAL BUILDING BAY AMENDED	GD	RT 29.04.22
P06	UPDATED TO SUIT CLIENT COMMENTS	GD	RT 29.03.22
P05	SCHEME UPDATED TO SUIT OPTION 1B	GD	RT 24.01.22
P04	LAND REGISTRY BOUNDARY ADDED	GD	RT 04.11.21
P03	SOUTHERN END OF MRF BUILDING REDUCED IN LENGTH	RT	AMC 09.11.21

Rev Owner Ap Chk Date

Client: suez

Project: PROPOSED WASTE FACILITY HALLENBEAGLE, SCORRIER, CORNWALL

Drawing Status: PRELIMINARY

clarkebond
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Bristol Exeter London

Drawing Title: PROPOSED SITE LAYOUT COMMENTS

Consultant Project No: E05387

Status: S2

Originator	Zone	Level	Type	Role	Number
HLB	CB	XX	XX	SK	C SK121

Scale: 1/500 @ A0

Date: 07/2021

Drawn: AMC

Checked: MKR

Sheet Size: A0

P10

DWG PATH: N:\JOBS\E05387 - HALLENBEAGLE, SUEZ\CAD_BIM\CAD_DRAWINGS\STAGE 2 DESIGN\SITE LAYOUT\E05387-CB-XX-XX-SK-C-SK121.DWG

APPENDIX C
SUMMARY OF LEGISLATION AND POLICY RELATING TO LAND CONTAMINATION

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Land contamination is often addressed via the planning process during redevelopment of sites. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, July 2021. For sites in Wales, reference should be made to Planning Policy Wales (Welsh Government. Edition 11, February 2021).

The new framework has limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land.

118. Planning policies and decisions should:

c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water

- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

1. *The above information is provided for background but does not constitute site-specific advice*
2. *The above summary applies to England only. Variations exist within other countries of the United Kingdom*

APPENDIX D
TECHNICAL BACKGROUND

H1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low

	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

H2 Site Investigation Methodology

Ground gas monitoring

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO_2), methane (CH_4) and oxygen (O_2) in percentage by volume, while hydrogen sulphide (H_2S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round, all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

Low flow groundwater sampling

Groundwater samples were retrieved using a United States Environment Protection Agency (USEPA) approved low-flow purging and sampling methodology.

The low-flow method relies on moving groundwater through the well screen at approximately the same rate as it flows through the geological formation. This results in a significant reduction in the volume of water extracted before sampling and significantly reduces the amount of disturbance of the water in the monitoring well during purging and sampling. Drawdown levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) are monitored during low-flow purging and sampling, with stabilisation indicating that purging is complete and sampling can begin. As the flow rate used for purging, in most cases, is the same or only slightly higher than the flow rate used for sampling, and because

purging and sampling are conducted as one continuous operation in the field, the process is referred to as low-flow purging and sampling.

Reuse of suitable materials

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current reuse scenarios covered by the CoP comprise

- reuse on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed soil treatment facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not permitted currently under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on-sites undergoing development, four factors are considered to be of particular relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

The MMP establishes whether specific materials are classified as waste and how excavated materials will be treated and/or reused in line with the CoP. The MMP is likely to form part of the site waste management plan.

APPENDIX E
EXPLORATORY HOLE RECORDS

DRAFT

RSK GEOSCIENCES

BOREHOLE LOG

Contract:	Client:	Borehole:
Hallenbeagle	Suez	BH1

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	06.07.22 End: 06.07.22	---	---	1 of 1

Drilling Progress Log		Samples & Testing			Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)	No	Type	Results					
0.50 0.50		1	ES PID	1xT+1xJ+1xV 0.0ppm			TOPSOIL. Grass over brown becoming reddish brown clayey subangular fine to coarse GRAVEL of various lithologies including quartz.	0.20	
							MADE GROUND. Brown slightly silty sandy angular fine to coarse GRAVEL of various lithologies. Fragments of tarmac, plastic, textile and cloth. Low angular cobble content.	(0.70) 0.90	
							Reddish brown sandy arisings (open hole).	(4.10)	OH
							Hole terminated at 5.0m bgl.	5.00	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.9m depth (terminated on hard stratum).
3. Borehole terminated at 5.00m depth.
4. No groundwater encountered.

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary openhole	Unknown	Graham Williams	RLockyer	MAS

AGS

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RSK GEOSCIENCES

BOREHOLE LOG

Contract:	Client:	Borehole:
Hallenbeagle	Suez	BH2

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	06.07.22 End: 06.07.22	---	---	1 of 1

Drilling Progress Log		Samples & Testing			Backfill & Instrumentation	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	Drill Time (hh:mm)	No	Type	Results					
0.50 0.50		1	ES PID	1xT+1xJ+1xV 0.0ppm			TOPSOIL. Grass over brown gravelly SILT Gravel is angular fine to coarse of igneous and metamorphic rock.	0.20	
							Yellow brown slightly silty slightly gravelly CLAY. Gravel is angular fine to coarse of various lithologies.	(0.70) 0.90	
							Reddish brown sandy arisings (open hole).	(4.10)	OH
							Hole terminated at 5.0m bgl.	5.00	

Drilling Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 0.9m depth (terminated on hard stratum).
3. No groundwater encountered.
4. Borehole terminated at 5.0m depth.

All dimensions in metres | Scale: 1:50

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary openhole	Unknown	Graham Williams	RLockyer	MAS

AGS

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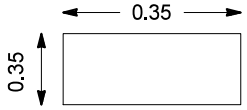
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	HP01

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	06.07.22	---	---	1 of 1
	End: 06.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.40	1	ES	2xT+1xJ+1xV			MADE GROUND: Brown slightly gravelly sandy SILT. Sand is fine. Gravel is angular to subangular fine to coarse of various lithologies including slate, ceramic, quartz and igneous rock (stockpile material).	(0.90)	
0.80	2	ES	2xT+1xJ+1xV				0.90	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit backfilled with arisings in reverse order upon completion.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Inspection pit + Hand dug	Hand tools	RLockyer	MAS

DRAFT

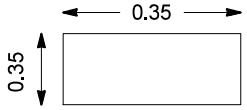
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	HP02

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	06.07.22 End: 06.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND. Brown slightly gravelly sandy SILT. Sand is fine. Gravel is angular to subangular fine to coarse of various lithologies including slate, ceramic, quartz, igneous rock (stockpile material).	(0.90)	
0.50 0.50	1	ES PID	2xT+1xJ+1xV 0.0ppm					
0.80 0.80	2	ES PID	2xT+1xJ+1xV 0.0ppm				0.90	

Plan (Not to Scale)



General Remarks

1. Inspection pit backfilled with arisings in reverse order upon completion.
2. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Inspection pit + Hand dug	Hand tools	RLockyer	MAS

DRAFT

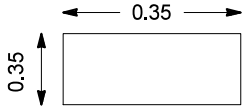
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	HP03

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	06.07.22 End: 06.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.40 0.40	1	ES PID	2xT+1xJ+1xV 0.0ppm			MADE GROUND Brown slightly gravelly sandy silt. Sand is fine. Gravel is angular to subangular fine to coarse of various lithologies including slate, ceramic, quartz, igneous rock (stockpile material).	(0.90)	
0.80 0.80	2	ES PID	2xT+1xJ+1xV 0.0ppm				0.90	

Plan (Not to Scale)



General Remarks

1. Inspection pit backfilled with arisings in reverse order upon completion.
2. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Inspection pit + Hand dug	Hand tools	RLockyer	MAS

DRAFT

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP01A

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	04.07.22	---	---	1 of 1
	End: 04.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL. Grass over brown becoming reddish/pink brown clayey subangular fine to coarse GRAVEL of quartz.	0.20	
						MADE GROUND. Reddish brown clayey angular fine to coarse GRAVEL AND COBBLES of metamudstone/metasandstone.	(0.60)	
							0.80	
						MADE GROUND. Grey coarse slightly silty slightly clayey fine SAND.	0.90	
						Trial pit terminated due to services between 0.80 and 0.90mbgl (2no. water pipes & 1no. disused cable).		

Plan (Not to Scale)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP01B

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 04.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL. Grass over brown becoming reddish/pink brown clayey subangular fine to coarse GRAVEL of quartz.	0.20	
0.50 0.50	1	ES PID	0.0ppm			MADE GROUND: brown to reddish brown silty angular fine to coarse gravel of various lithologies including metamudstone and metasandstone.	(0.80) 1.00	
						Yellow brown silty CLAY.	(0.30) 1.30	
						Reddish brown and yellow brown slightly sandy slightly silty angular to subangular fine to coarse GRAVEL of various lithologies. Low cobble content. (PORTHTOWAN FORMATION)	(0.70) 2.00	
						Trial pit terminated at 2.0mbgl.		

Plan (Not to Scale)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

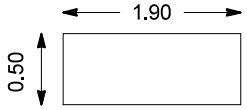
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP02

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 04.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Grass over brown becoming reddish/pink brown clayey subangular fine to coarse GRAVEL of quartz.	0.20	
						. . . Frequent rootlets.		
						MADE GROUND. Grass over brown silty angular fine to coarse gravel of various lithologies.	(0.80)	
0.50 0.50	1	ES PID	0.0ppm				1.00	
						MADE GROUND. Yellow to red brown slightly silty sandy angular coarse GRAVEL of metamudstone with medium cobble content.		
						. . . Wooden beam and plastic bottles.	(1.00)	
							2.00	
						Trial pit terminated at 2.0mbgl.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

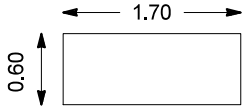
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP03

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 04.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Grass over brown becoming reddish/pink brown clayey subangular fine to coarse GRAVEL of quartz.	0.20	
						MADE GROUND: grass over brown slightly silty slightly clayey angular to subangular fine to coarse GRAVEL of metamudstone.	(0.30) 0.50	
0.50 0.50	1	ES PID	0.0ppm			MADE GROUND. Pale brown silty fine to medium SAND.	(0.30) 0.80	
						Dark reddish brown slightly silty sandy subangular medium to coarse GRAVEL of various lithologies including mudstone and quartz. High cobble content.	(1.20) 2.00	
						Hole terminated at 2.0mbgl.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

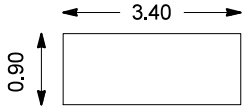
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP04

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 06.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL brown slightly gravelly SILT. Frequent rootlets. Gravel is angular fine to medium of various lithologies.	0.20	
						MADE GROUND. Brown becoming yellow and red brown slightly clayey GRAVEL of metamorphic rocks. Fragments of plastic and cloth.	(1.80)	
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm					
							2.00	
						Reddish brown sandy angular fine to coarse GRAVEL of weathered metamudstone/metasandstone. (PORTHTOWAN FORMATION)	(1.80)	
							3.80	
						Terminated at 3.8m due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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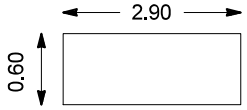
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP05

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22 End: 05.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			MADE GROUND. Brown and red brown slightly sandy GRAVEL and COBBLES of metamorphic rocks. Sand is coarse. Occasional pockets of clay. Fragments of plastic and textile.	(1.65) 1.65	
						Reddish brown and white slightly silty very sandy angular GRAVEL of metamorphic rocks and hard clay. Sand is coarse. . . . Occasional boulders (upto 0.80x0.40x0.45m) of metamorphic rock between 2.60m and 3.00m.	(2.15) 3.80	
						Trial pit terminated at 3.8mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

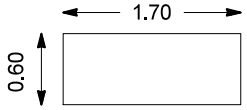
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP06

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 04.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			MADE GROUND: Reddish brown sandy angular to subangular fine to coarse GRAVEL and COBBLES of various lithologies including slate, metamudstone/metasandstone and quartz.	(2.00) 2.00	
						Pale brown and pale yellow slightly silty very sandy GRAVEL of various lithologies including slate and metamudstone. (PORTHTOWAN FORMATION)	(1.00) 3.00	
						Hole terminated at 3.0m due to hard strata - potentially concrete		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.
4. Trial pit remained stable during excavation.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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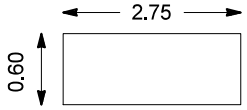
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP07

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22 End: 05.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			MADE GROUND Brown slightly silty slightly sandy GRAVEL and COBBLES of metamorphic rock. Low boulder content.	(2.00) 2.00	
						Pale reddish brown and pale grey mottled yellow sandy angular fine to coarse GRAVEL of weak metamudstone/clay. (PORTHTOWAN FORMATION)	(2.00) 4.00	
						Trial pit terminated at 4.0mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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TRIAL PIT LOG

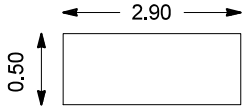
Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP08

Contract Ref:	Start: 05.07.22	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 05.07.22	---	---	1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL. Grass over brown gravelly SILT. Gravel is angular fine to medium of various lithologies. Rootlets <5mm diameter. Rare fragments of glass.	(0.30) 0.30	
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			MADE GROUND reddish brown and yellow brown slightly gravelly CLAY. Gravel is angular fine to medium of various lithologies.	(2.30) 2.60	
2.60 2.60	2	ES PID	1xT+1xJ+1xV 0.0ppm			Red brown silty angular coarse GRAVEL of weak metamudstone. High angular cobble content. (PORTHTOWAN FORMATION)	(1.90) 4.50	

Trial pit terminated at 4.5mbgl due to hard strata.

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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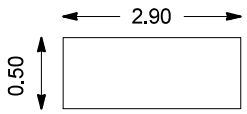
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP08

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22	---	---	2 of 2
	End: 05.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					

Plan (Not to Scale)



General Remarks

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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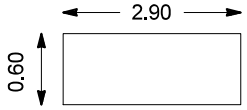
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP09

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22 End: 05.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL. brown gravelly SILT. Gravel is angular to subangular coarse of various lithologies. Frequent rootlets <3mm diameter.	0.20	
						MADE GROUND. Brown slightly gravelly silty fine SAND. Gravel is angular to subangular fine to coarse of metamorphic rock. Low cobble content.	(0.40)	
0.50	1	ES	1xT+1xJ+1xV				0.60	
						Reddish brown slightly silty sandy angular fine to coarse GRAVEL of weathered and weak mudstone. (PORTHTOWAN FORMATION)		
0.90		PID	0.0ppm				(3.20)	
							3.80	
						Trial pit terminated at 3.8mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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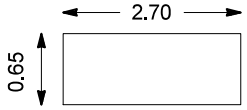
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP10

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 05.07.22	---	---	1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: brown slightly sandy slightly gravelly SILT. Sand is fine. Gravel is subangular fine of various lithologies.	(0.30)	
							0.30	
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			Pale reddish brown mottled yellow brown clayey GRAVEL of various lithologies. (PORTHTOWAN FORMATION)		
						. . . Boulder of metamorphic rock (0.80x0.59x0.32m) at 2.0mbgl.	(4.50)	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

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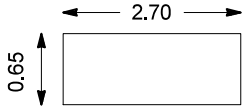
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP10

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22 End: 05.07.22	---	---	2 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						Pale reddish brown mottled yellow brown clayey GRAVEL of various lithologies. (PORTHTOWAN FORMATION) *(stratum copied from 0.30m from previous sheet)*	4.80	
						Trial pit terminated at 4.8mbgl.		

Plan (Not to Scale)



General Remarks

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

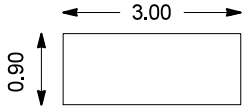
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP11

Contract Ref:	Start: 06.07.22	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 06.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			TOPSOIL. Brown gravelly SILT. Gravel is angular fine to coarse of quartz and metamorphic rocks.	0.20	
						MADE GROUND. Brown clayey angular medium GRAVEL of various lithologies with pockets of yellow brown and grey silty clay. Fragments of plastic, metal and textile.	(1.00) 1.20	
						Pale reddish brown slightly clayey slightly sandy angular fine to medium GRAVEL of various lithologies. Sand is fine to medium. (PORTHTOWAN FORMATION)	1.40	
						Cream/white slightly gravelly CLAY with frequent quartz cobbles. (PORTHTOWAN FORMATION)	(0.50) 1.90	
						White and grey slightly sandy slightly clayey angular GRAVEL and COBBLES of quartz, metamorphic rocks and mudstone. Frequent pockets of clay. (PORTHTOWAN FORMATION)	(2.00) 3.90	
						Trial pit terminated at 3.9mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Trial pit backfilled with arisings in reverse order upon completion.
2. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

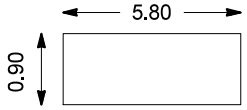
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP12

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	06.07.22	---	---	1 of 1
	End: 06.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown slightly gravelly SILT. Gravel is angular fine to medium of various lithologies including metamorphic and igneous rock. Frequent rootlets. Frequent fragments of glass.	0.10	
						MADE GROUND: Brown slightly clayey angular fine to coarse GRAVEL of various lithologies. Roots upto 20mm diameter.	(0.60)	
							0.70	
						Orange and reddish brown slightly sandy slightly clayey angular to subangular fine to coarse GRAVEL of metamorphic rocks. (PORTHTOWAN FORMATION)	(0.70)	
							1.40	
1.40 1.40	1	ES PID	1xT+1xJ+1xV 0.0ppm			White/cream slightly sandy gravelly CLAY. Gravel is angular coarse of weak metamudstone and quartz. Sand is medium. (PORTHTOWAN FORMATION)	(2.00)	
							3.40	
						Trial pit terminated at 3.40mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

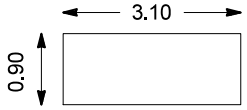
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP13

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 06.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL. Brown slightly gravelly SILT. Gravel is angular fine to coarse of various lithologies. Frequent rootlets.	0.20	
0.50 0.50	1	ES PID	1xT+1xJ+1xV 0.0ppm			MADE GROUND. Brown slightly silty slightly sandy angular medium GRAVEL of metamorphic rocks with pockets of gravelly clay and fragments of plastic. Low cobble content. Sand is fine.	(1.00) 1.20	
						MADE GROUND: Orange brown mottled white slightly gravelly silty CLAY. Gravel is angular medium of quartz. Low cobble content of igneous and metamorphic rocks.	(1.20) 2.40	
						White gravelly CLAY with high cobble content. Gravel is angular coarse of weathered metamudstone. (PORTHTOWAN FORMATION)	(1.25) 3.65	
						Trial pit terminated at 3.65m due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

DRAFT

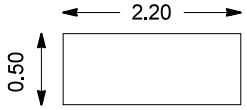
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP14

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22	---	---	1 of 1
	End: 05.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50	1	ES	1xT+1xJ+1xV			MADE GROUND. Brown slightly silty sandy GRAVEL of various lithologies including mudstone. Medium cobble content. Rare boulders (upto 0.43x0.22x0.25m) of metamorphic rocks. Frequent fragments of plastic, wood and metal.	(0.80) 0.80	
						Reddish brown slightly clayey angular fine GRAVEL with pockets of yellow brown and white clay. (PORTHTOWAN FORMATION)	(1.20) 2.00	
						Trial pit terminated at 2.0mbgl.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

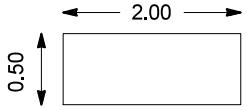
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP15

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	05.07.22	---	---	1 of 1
	End: 05.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.50	1	ES	1xT+1xJ			MADE GROUND. Brown slightly silty very sandy angular fine to coarse GRAVEL of various lithologies including metamudstone. Occasional fragments of plastic and wood. Low angular cobble content.	(0.80) 0.80	
						Brown slightly gravelly fine to coarse SAND. Gravel is angular to rounded fine of metamudstone and metasandstone. (PORTHTOWAN FORMATION)	(0.40) 1.20	
						Pale brown and pale reddish brown slightly clayey angular fine to coarse GRAVEL of metamorphic rocks. (PORTHTOWAN FORMATION)	(0.80) 2.00	
						Trial pit terminated at 2.00mbgl.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

DRAFT

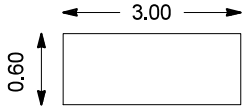
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP16

Contract Ref:	Start: 11.07.22	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 11.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL with frequent roots.	0.20	
						MADE GROUND. Brown slightly clayey sandy angular fine to medium GRAVEL of various lithologies. Occasional fragments of metal, plastic and cloth. Sand is fine.	(0.70)	
							0.90	
1.00-1.20	1	B				Reddish brown sandy angular fine to coarse GRAVEL of metamudstone. Moderate cobble content. Sand is medium. (PORTHTOWAN FORMATION)		
2.00-2.20	2	B					(2.30)	
3.00-3.20	3	B						
							3.20	
						Terminated at 3.2m due to unstable sides.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

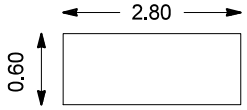
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP17

Contract Ref:	Start: 11.07.22	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 11.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	0.20	
						MADE GROUND . Slightly clayey slightly sandy angular fine to medium GRAVEL . Medium cobble content. Occasional fragments of textile and plastic fragments. Sand is fine to coarse.	(2.00)	
1.00-1.70	1	B						
2.00-2.20	2	B					2.20	
						Reddish brown slightly silty slightly sandy angular fine to coarse GRAVEL of metamudstone/slate. Sand is fine to coarse. Moderate cobble content. (PORTHTOWAN FORMATION)	(1.80)	
3.00-3.20	3	B						
							4.00	
4.00-4.20	4	B				Trial pit terminated at 4.4m due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

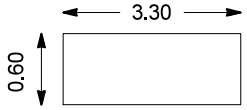
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP18

Contract Ref:	Start: 11.07.22	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 11.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL brown slightly gravelly SILT. Gravel is subangular fine to medium of various lithologies. Rare metal fragments.	0.20	
						MADE GROUND. Clayey reddish brown angular GRAVEL of metamorphic rocks with low cobble content.	(1.80)	
1.50-1.70	1	B					2.00	
						MADE GROUND. Yellow brown gravelly subangular COBBLES of igneous rock. Gravel is subangular coarse of igneous rock.	(1.70)	
2.50-2.70	2	B					3.70	
						Hole terminated at 3.7mbgl due to unstable sides and hard strata at the base.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

DRAFT

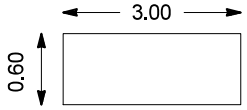
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP19

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	11.07.22	---	---	1 of 1
	End: 11.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	0.05	
						MADE GROUND. Brown slightly clayey sandy fine to medium GRAVEL of various lithologies. Sand is fine. Rare wood and concrete fragments.		
						. . . Cobble of concrete (0.35x0.30x0.05m) at 0.8m	(1.45)	
							1.50	
1.50-1.70	1	B				Reddish brown silty angular fine to coarse GRAVEL of weathered metamudstone. Low cobble content. (PORTHTOWAN FORMATION)	(1.20)	
2.50-2.70	2	B					2.70	
						Trial pit terminated at 2.7mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

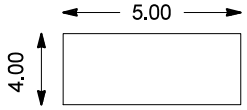
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP20

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	15.07.22 End: 15.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	0.20	
0.50-0.70	1	B				MADE GROUND: Greyish brown and cream clayey GRAVEL of various lithologies. Frequent fragments of concrete, rebar, disused wires, wood and plastic. Pockets of gravelly clay. . . . Pocket of coarse gravels (land drain) at 1.0mbgl.	(1.80)	
1.50-1.70	2	B					2.00	
						MADE GROUND: Gravelly subangular COBBLES of igneous rock.	(0.75)	
						. . . Concrete. Trial pit terminated at 2.75mbgl due to the presence of concrete.	2.75	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. Water seepage at 1.00m depth.
4. Trial pit refused at 2.75m depth due to concrete.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	13 Ton Tracked Excavator	RLockyer	MAS

AGS

DRAFT

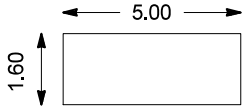
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP21

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	15.07.22	---	---	1 of 1
	End: 15.07.22			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	0.20	
						MADE GROUND. Brown silty GRAVEL of various lithologies including slate and igneous rock. Frrequnt fragments of metal, plastic, wires and glass	(1.60)	
1.50-1.70	1	B						
						1.80		
						. . . Concrete Trial pit terminated at 1.8mbgl due to the presence of concrete.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.
4. Trial pit refused at 1.80m depth due to concrete.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	13 Ton Tracked Excavator	RLockyer	MAS

AGS

DRAFT

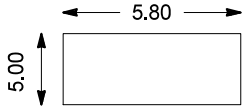
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP22

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	04.07.22 End: 04.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	0.20	
						MADE GROUND. Brown slightly clayey sandy angular coarse GRAVEL of various lithologies. Sand is fine. Frequent fragments of wood, glass and metal. . . . Boulders upto 0.75x0.5x0.4m	(1.20) 1.40	
						Cream gravelly CLAY. Gravel is angular fine to coarse of weathered metamorphic rocks. (PORTHTOWAN FORMATION)	(1.10) 2.50	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	JCB-3CX	RLockyer	MAS

AGS

DRAFT

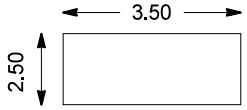
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP23

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	15.07.22 End: 15.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	(0.30) 0.30	
						MADE GROUND. Reddish brown slightly clayey GRAVEL and COBBLES of various lithologies. Fragments of glass, plastic, tyre and ceramic.	(1.90) 2.20	
1.00-1.20	1	B				MADE GROUND. Brown angular COBBLES of igneous rocks.	(1.50) 3.70	
						. . . Concrete Trial pit terminated at 3.7mbgl due to the presence of concrete.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.
4. Trial pit refused at 3.70m depth due to concrete.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	13 Ton Tracked Excavator	RLockyer	MAS

AGS

DRAFT

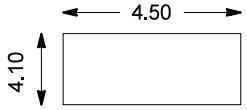
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP24

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 15.07.22	---	---	1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL. Pale grey to greyish brown gravelly SILT. Gravel is angular to subangular coarse of various lithologies.	0.20	
0.50-0.60	1	B				MADE GROUND. Brown silty angular fine to coarse GRAVEL of various lithologies including metamorphic rock. Fragments of wood and metal barbed wire. Medium cobble content of metamorphic rocks and igneous rock.	(0.80)	
							1.00	
1.00-1.20	2	B				Orange brown slightly gravelly slightly silty fine SAND with frequent pockets of silty clay. Gravel is angular to subangular coarse of various lithologies including quartz, metamorphic rocks and clay. Low cobble content of metamorphic rocks. (PORTHTOWAN FORMATION)	(0.70)	
							1.70	
						Terminated at 1.7mbgl due to hard strata.		

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	13 Ton Tracked Excavator	RLockyer	MAS

AGS

DRAFT

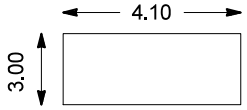
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP25

Contract Ref:	Start:	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	15.07.22 End: 15.07.22	---	---	1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						TOPSOIL: Brown silty angular gravelly SILT. Gravel is subangular fine to coarse of various lithologies.	0.20	
						MADE GROUND. Reddish brown clayey angular fine to coarse GRAVEL of various lithologies. Fragments of metal and textile. . . . Boulder of metamorphic rock (1.2 x1.6x0.5m) at 0.60mbgl .	(2.50)	
						MADE GROUND. Yellow brown gravelly subangular COBBLES of igneous rock. Gravel is subangular coarse of igneous rock.	2.70 (2.50)	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Trial pit backfilled with arisings in reverse order upon completion.
3. No groundwater encountered.
4. Trial pit refused at 5.20m depth due to concrete.

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	13 Ton Tracked Excavator	RLockyer	MAS

DRAFT

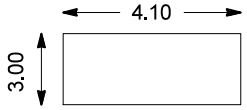
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Hallenbeagle	Suez	TP25

Contract Ref:	Start: 15.07.22	Ground Level:	National Grid Co-ordinate:	Sheet:
315111	End: 15.07.22	---	---	2 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
						MADE GROUND. Yellow brown gravelly subangular COBBLES of igneous rock. Gravel is subangular coarse of igneous rock. *(stratum copied from 2.70m from previous sheet)*	5.20	
						. . . Concrete Trial pit terminated at 5.2mbgl due to the presence of concrete.		

Plan (Not to Scale)



General Remarks

All dimensions in metres | Scale: 1:25

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	13 Ton Tracked Excavator	RLockyer	MAS

AGS

APPENDIX F
PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 1	
Date: 06/07/22	
BH1	

Photo No. 2	
Date: 06/07/22	
BH2	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 3 **Date:** 06/07/22 HP02	
Photo No. 4 **Date:** 06/07/22 HP03	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 5	
Date: 04/07/22	
TP01A	

Photo No. 6	
Date: 04/07/22	
TP01A	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 7 **Date:** 04/07/22 TP01B	
Photo No. 8 **Date:** 04/07/22 TP02	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 9	
Date: 04/07/22	
TP03	

Photo No. 10	
Date: 06/07/22	
TP04	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 11	
Date: 05/07/22	
TP05	

Photo No. 12	
Date: 04/07/22	
TP06	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 13	
Date: 05/07/22	
TP07	

Photo No. 14	
Date: 05/07/22	
TP08	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 15	
Date: 05/07/22	
TP09	

Photo No. 16	
Date: 05/07/22	
TP10	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 17	
Date: 06/07/22	
TP11	

Photo No. 18	
Date: 06/07/22	
TP12	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 19	
Date: 06/07/22	
TP13	

Photo No. 20	
Date: 05/07/22	
TP14	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 21	
Date: 05/07/22	
TP15	

Photo No. 22	
Date: 11/07/22	
TP17	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 23	
Date: 11/07/22	
TP18	

Photo No. 24	
Date: 11/07/22	
TP19	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

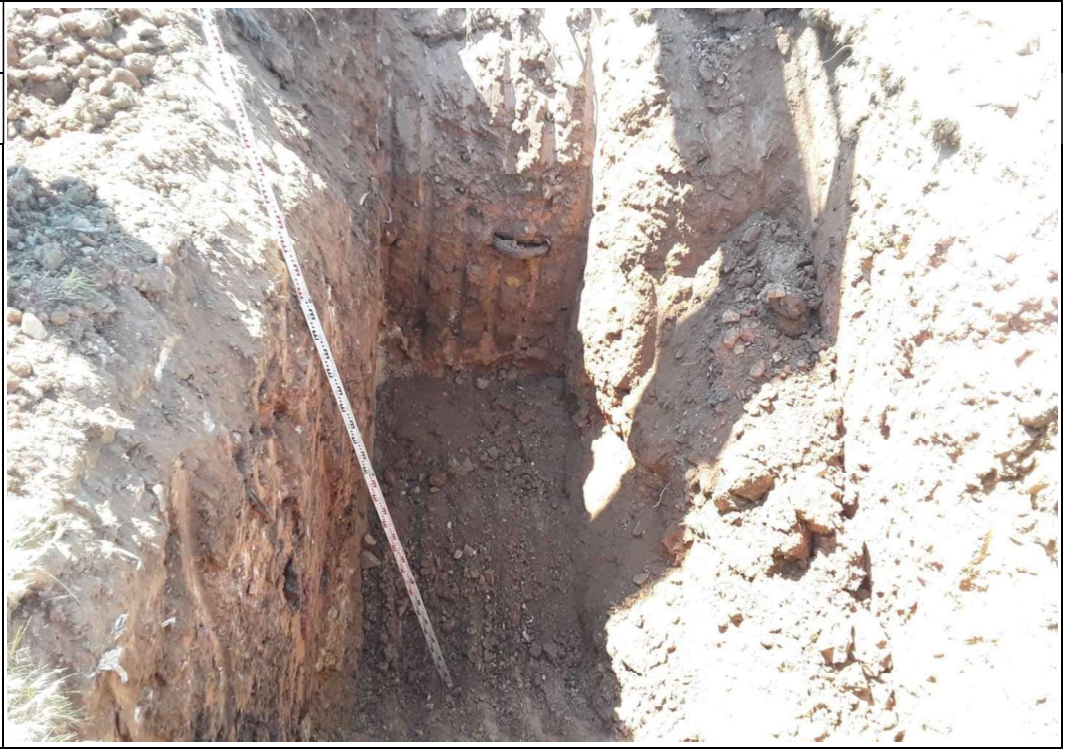
Photo No. 25	
Date: 15/07/22	
TP20	

Photo No. 26	
Date: 15/07/22	
TP21	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 27	
Date: 15/07/22	
TP22	

Photo No. 28	
Date: 15/07/22	
TP23	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 29	
Date: 15/07/22	
TP24	

Photo No. 30	
Date: 15/07/22	
TP25	

PHOTOGRAPHIC LOG

Site Location: Hallenbeagle

Photo No. 31	
Date: 15/07/22	
TP25	

APPENDIX G
GROUND GAS MONITORING DATA AND SITE CONDITIONS

GAS MONITORING FIELD SHEET

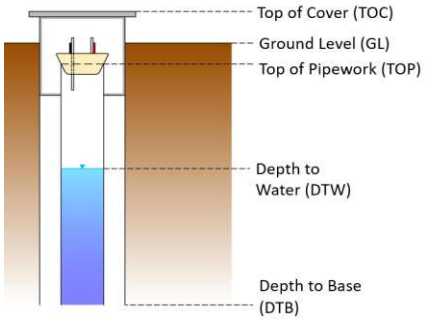
Monitoring Date:	02/08/2022	Measurement datum: TOC / GL / TOP / Other		Offset to GL (m):	
Pre-Testing Remarks:		Air Temperature: °C		Device:	
		Weather:		Serial Number:	
		Ground Conditions:		Daily Check:	
		Wind: NONE / LIGHT / MEDIUM / STRONG			
		Tidal State: (if applicable) High / Low / Rising / Falling			
Exploratory Position ID:	BH1	Monitoring Round Number:	1	Test Number:	1
Install Type: SINGLE / DOUBLE	Single	Pipe Ref: 1) Shallow 2) Deep		Pipe Diameter: 19mm/ 40mm / 50mm / Other (mm)	50

Time of Monitoring (hh:mm)	Flow readings	Gas readings	Atmospheric Pressure (mb)	Differential Pressure (mb)	Gas tap: SINGLE / DOUBLE	
Time Start (hh:mm)			1004	-0.1	Observations (e.g. on-site activities):	
Time End (hh:mm)						

Stage 1 Flow Readings	**Stage 1** Flow Readings	**Stage 2** Gas Monitoring:	Methane	Carbon Dioxide	Oxygen	Carbon monoxide	Hydrogen sulphide	LEL	PID
Time of flow monitoring (sec)	Flow Reading (l/hr)	Time of gas monitoring (sec)	(%/vol)	(%/vol)	(%/vol)	(ppm)	(ppm)	(%)	(ppm)
0	0	0	0	0	20.8	0	0	79.2	
5	0	15	0	4.2	18.5	1	1	77.5	
10	0	30	0	4.7	17.1	2	2	77.9	
15	0	60	0	4.9	17	3	3	78.1	
20	0	90	0	5	16.9	4	4	78.1	
25	0	120	0	5.2	16.7	5	5	78.1	
30	0	180	0	5.7	16.4	6	6	77	
40	0	240	0	5.6	16.3	7	7	77.8	
50	0	300	0	6.1	16.2	8	8	77.7	
60		360	0						
90		420							
120		480							
150		540							
180		600							

Stage 1 gas flow - Peak (l/h)	0	**Note:** Flow should be recorded at 5 second intervals up to 30 seconds, 10 second intervals to 2 minutes and 30 second intervals up to 3 minutes or until steady-state readings are obtained. Typically, steady state conditions occur within 30 seconds to a minute. The differential pressure reading (in Pa) should also be recorded during this period.
Stage 1 gas flow - Steady State (l/h)	0	

STAGE 3 WATER LEVEL OBSERVATION					
Depth (from datum) to water (DTW): (m)		Time:		LNAPL Top (from datum) (m):	
Depth (from datum) to well base (DTB): (m)	4.62	Purge Start:		DNAPL Top (from datum) (m):	
Hole Purged: Yes / No	No	Purge End:		Water Observations:	
Purge Volume: (ltrs)		Post-Purge (DTW) (m)			



Post testing remarks:	Samples Taken: Yes / No	No
	Sample Media: Gas/Water	
No groundwater.	Gas Cannister Start (mb)	
	Gas Cannister End (mb)	
	Gas Cannister Duration (mins)	

Depth (from datum)	Sample Ref	Type (EW / G)	Container

Contract Name:	Hallenbeagle	Data Collected By:	OG
Project Manager / Engineer:		Checked:	
Contract Ref:	315111	Page number:	

GAS MONITORING FIELD SHEET

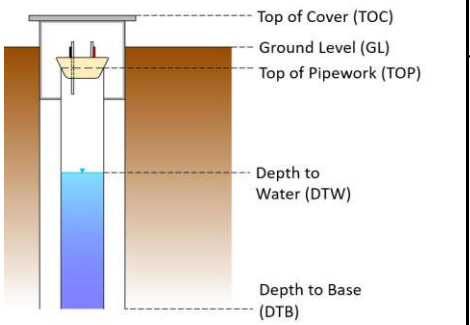
Monitoring Date:	02/08/2022	Measurement datum: TOC / GL / TOP / Other		Offset to GL (m):		
Pre-Testing Remarks:		Air Temperature: °C		Device:		
Gas tap open		Weather:		Serial Number:		
		Ground Conditions:		Daily Check:		
		Wind: NONE / LIGHT / MEDIUM / STRONG				
		Tidal State: (if applicable) High / Low / Rising / Falling				
Exploratory Position ID:	BH2	Monitoring Round Number:	1	Test Number:	1	
Install Type: SINGLE / DOUBLE	Single	Pipe Ref: 1) Shallow 2) Deep		Pipe Diameter: 19mm/ 40mm / 50mm / Other (mm)	50	

Time of Monitoring (hh:mm)	Flow readings	Gas readings	Atmospheric Pressure (mb)	Differential Pressure (mb)	Gas tap: SINGLE / DOUBLE	
Time Start (hh:mm)					Observations (e.g. on-site activities):	
Time End (hh:mm)						

Stage 1 Flow Readings	**Stage 1** Flow Readings	**Stage 2** Gas Monitoring:	Methane	Carbon Dioxide	Oxygen	Carbon monoxide	Hydrogen sulphide	LEL	PID
Time of flow monitoring (sec)	Flow Reading (l/hr)	Time of gas monitoring (sec)	(%/vol)	(%/vol)	(%/vol)	(ppm)	(ppm)	(%)	(ppm)
0	0	0	0	0	21	0	0	79	
5	0	15	0	4.2	18.5	0	0	77.9	
10	0	30	0	4.2	17.6	0	0	78.2	
15	0	60	0	4.1	17.7	0	0	79.2	
20	0	90	0	4.1	18.7	0	0	80.2	
25	0	120	0	4.1	19.7	0	0	81.2	
30	0	180	0	4.1	20.7	0	0	82.2	
40	0	240							
50	0	300							
60	0	360	0						
90		420							
120		480							
150		540							
180		600							

Stage 1 gas flow - Peak (l/h)	0	**Note:** Flow should be recorded at 5 second intervals up to 30 seconds, 10 second intervals to 2 minutes and 30 second intervals up to 3 minutes or until steady-state readings are obtained. Typically, steady state conditions occur within 30 seconds to a minute. The differential pressure reading (in Pa) should also be recorded during this period.
Stage 1 gas flow - Steady State (l/h)	0	

STAGE 3 WATER LEVEL OBSERVATION					
Depth (from datum) to water (DTW): (m)		Time:		LNAPL Top (from datum) (m):	
Depth (from datum) to well base (DTB): (m)	4.72	Purge Start:		DNAPL Top (from datum) (m):	
Hole Purged: Yes / No	No	Purge End:		Water Observations:	
Purge Volume: (ltrs)		Post-Purge (DTW) (m)			



Post testing remarks:	Samples Taken: Yes / No	No
	Sample Media: Gas/Water	
No groundwater	Gas Cannister Start (mb)	
	Gas Cannister End (mb)	
	Gas Cannister Duration (mins)	

Depth (from datum)	Sample Ref	Type (EW / G)	Container

Contract Name:	Hallenbeagle	Data Collected By:	OG
Project Manager / Engineer:		Checked:	
Contract Ref:	315111	Page number:	

APPENDIX H
LABORATORY CERTIFICATES FOR SOIL ANALYSIS

envirolab
Units 7 & 8, Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

Final Test Report

Envirolab Job Number:	22/06752
Issue Number:	1
Date:	27-Jul-22
Client:	RSK Environment Ltd Bristol The Old School Stillhouse Lane Bedminster Bristol UK, BS3 4EB
Project Manager:	Rachael Lockyer
Project Name:	Hallenbeagle
Project Ref:	315111
Order No:	N/A
Date Samples Received:	11-Jul-22
Date Instructions Received:	11-Jul-22
Date Analysis Completed:	25-Jul-22

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

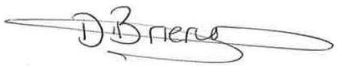
IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:



Danielle Brierley
Deputy Client Services Supervisor

envirolab

Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/06752/16						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				HP01						
Depth to Top				0.4						
Depth to Bottom										
Date Sampled				06/07/2022						
Sample Type				Soil						
Sample Matrix Code				5AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**7.30**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.03**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**7.8**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**2.53**				3	5	6
PAH Sum of 17 (mg/kg) $_A$	A-T-019	N	N	**1.34**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$	A-T-007	N	N	**19**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	0.829	0.454	1.687	**4.980**	0.5	2	25
Barium	A-T-025	N	N	0.050	0.027	0.102	**0.300**	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.007	0.004	0.014	**0.040**	0.5	10	70
Copper	A-T-025	N	N	0.318	0.169	0.647	**1.870**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.006	0.003	0.012	**0.030**	0.4	10	40
Lead	A-T-025	N	N	0.085	0.049	0.173	**0.530**	0.5	10	50
Antimony	A-T-025	N	N	0.003	0.003	0.006	**0.030**	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.195	0.113	0.397	**1.230**	4	50	200
Chloride	A-T-026	N	N	12	4	24	**53**	800	15000	25000
Fluoride	A-T-026	N	N	1.2	1.0	2.4	**11.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	8	2	16	**23**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	121	44	246	**530**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	55.2	29.60	112	**326**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.8	7.6					
Conductivity (µS/cm)	A-T-037	N	N	243	88					
Mass Sample (kg)				0.181						
Dry Matter (%)	A-T-044	N	N	96.6						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation

envirolab

Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/06752/17						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				HP01						
Depth to Top				0.8						
Depth to Bottom										
Date Sampled				06/07/2022						
Sample Type				Soil						
Sample Matrix Code				4AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**7.08**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.03**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**5.7**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**2.44**				3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N	**0.28**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$	A-T-007	N	N	**15**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	1.136	0.347	2.305	**4.380**	0.5	2	25
Barium	A-T-025	N	N	0.060	0.021	0.122	**0.260**	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.010	0.003	0.020	**0.040**	0.5	10	70
Copper	A-T-025	N	N	0.392	0.131	0.795	**1.610**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.006	0.002	0.012	**0.020**	0.4	10	40
Lead	A-T-025	N	N	0.152	0.045	0.308	**0.570**	0.5	10	50
Antimony	A-T-025	N	N	0.004	0.003	0.008	**0.030**	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.190	0.062	0.385	**0.770**	4	50	200
Chloride	A-T-026	N	N	11	3	22	**43**	800	15000	25000
Fluoride	A-T-026	N	N	1.3	1.0	2.5	**10.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	30	4	60	**72**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	80	24	162	**305**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	37.7	23.60	76	**253**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.6	7.6					
Conductivity (µS/cm)	A-T-037	N	N	159	49					
Mass Sample (kg)				0.180						
Dry Matter (%)	A-T-044	N	N	97.2						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

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Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/06752/18						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				HP02						
Depth to Top				0.5						
Depth to Bottom										
Date Sampled				06/07/2022						
Sample Type				Soil						
Sample Matrix Code				4AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**6.71**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**<0.01**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**7.5**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**2.67**				3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N	**1.24**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$	A-T-007	N	N	**12**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	1.563	0.319	3.179	**4.620**	0.5	2	25
Barium	A-T-025	N	N	0.112	0.025	0.228	**0.350**	20	100	300
Cadmium	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.019	0.004	0.039	**0.060**	0.5	10	70
Copper	A-T-025	N	N	0.863	0.154	1.755	**2.360**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.014	0.002	0.028	**0.030**	0.4	10	40
Lead	A-T-025	N	N	0.234	0.047	0.476	**0.690**	0.5	10	50
Antimony	A-T-025	N	N	0.003	0.003	0.006	**0.030**	0.06	0.7	5
Selenium	A-T-025	N	N	0.002	<0.001	0.004	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.407	0.083	0.828	**1.200**	4	50	200
Chloride	A-T-026	N	N	20	8	40	**92**	800	15000	25000
Fluoride	A-T-026	N	N	1.1	0.9	2.2	**9.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	23	2	47	**40**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	64	<20	130	**<200**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	40	26.40	81	**280**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.4	7.4					
Conductivity (µS/cm)	A-T-037	N	N	129	38					
Mass Sample (kg)				0.181						
Dry Matter (%)	A-T-044	N	N	96.7						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

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Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/06752/19						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				HP02						
Depth to Top				0.8						
Depth to Bottom										
Date Sampled				06/07/2022						
Sample Type				Soil						
Sample Matrix Code				4AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**7.06**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.03**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**5.6**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**2.27**				3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N	**0.56**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$	A-T-007	N	N	**<10**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	1.324	0.395	2.684	**5.020**	0.5	2	25
Barium	A-T-025	N	N	0.089	0.030	0.180	**0.370**	20	100	300
Cadmium	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.015	0.004	0.030	**0.050**	0.5	10	70
Copper	A-T-025	N	N	0.698	0.171	1.415	**2.320**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.008	0.003	0.016	**0.040**	0.4	10	40
Lead	A-T-025	N	N	0.211	0.060	0.428	**0.770**	0.5	10	50
Antimony	A-T-025	N	N	0.006	0.005	0.012	**0.050**	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.360	0.104	0.730	**1.340**	4	50	200
Chloride	A-T-026	N	N	16	9	32	**97**	800	15000	25000
Fluoride	A-T-026	N	N	1.1	1.0	2.3	**10.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	31	4	63	**71**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	70	25	142	**302**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	54.8	26.80	111	**301**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.4	7.4					
Conductivity (µS/cm)	A-T-037	N	N	141	49					
Mass Sample (kg)				0.180						
Dry Matter (%)	A-T-044	N	N	97.4						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

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Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/06752/20						
Client Sample Number										
Client Sample ID				HP03						
Depth to Top				0.4						
Depth to Bottom								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Date Sampled				06/07/2022						
Sample Type				Soil						
Sample Matrix Code				4AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**7.77**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.03**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**5**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**1.48**				3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N	**1.22**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$	A-T-007	N	N	**19**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	0.605	0.526	1.229	**5.370**	0.5	2	25
Barium	A-T-025	N	N	0.029	0.020	0.059	**0.210**	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.004	0.003	0.008	**0.030**	0.5	10	70
Copper	A-T-025	N	N	0.187	0.127	0.380	**1.340**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.003	<0.001	0.006	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.004	0.003	0.008	**0.030**	0.4	10	40
Lead	A-T-025	N	N	0.041	0.032	0.083	**0.330**	0.5	10	50
Antimony	A-T-025	N	N	0.005	0.004	0.010	**0.040**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.125	0.099	0.254	**1.020**	4	50	200
Chloride	A-T-026	N	N	7	7	13	**70**	800	15000	25000
Fluoride	A-T-026	N	N	1.2	1.0	2.5	**10.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	28	4	57	**65**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	119	50	242	**580**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	37.7	26.90	77	**282**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.6	7.7					
Conductivity (µS/cm)	A-T-037	N	N	238	101					
Mass Sample (kg)				0.181						
Dry Matter (%)	A-T-044	N	N	96.9						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

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Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	22/06752/21						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				HP03						
Depth to Top				0.8						
Depth to Bottom										
Date Sampled				06/07/2022						
Sample Type				Soil						
Sample Matrix Code				4AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**8.13**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.08**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.05**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**ndp**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**1.98**				3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N	**1.5**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH\_CU\_1D\_AL}$	A-T-007	N	N	**31**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	0.549	0.499	1.110	**5.060**	0.5	2	25
Barium	A-T-025	N	N	0.023	0.016	0.047	**0.170**	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.003	0.002	0.006	**0.020**	0.5	10	70
Copper	A-T-025	N	N	0.154	0.111	0.312	**1.160**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.003	<0.001	0.006	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.003	0.002	0.006	**0.020**	0.4	10	40
Lead	A-T-025	N	N	0.029	0.023	0.059	**0.240**	0.5	10	50
Antimony	A-T-025	N	N	0.006	0.004	0.012	**0.040**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.089	0.078	0.180	**0.790**	4	50	200
Chloride	A-T-026	N	N	8	6	15	**64**	800	15000	25000
Fluoride	A-T-026	N	N	1.3	0.9	2.6	**10.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	28	1	57	**42**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	119	46	241	**544**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	36.9	25.90	75	**272**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.7	7.7					
Conductivity (µS/cm)	A-T-037	N	N	239	91					
Mass Sample (kg)				0.179						
Dry Matter (%)	A-T-044	N	N	97.8						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

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Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT
SUPPLEMENT TO TEST REPORT 22/06752/1

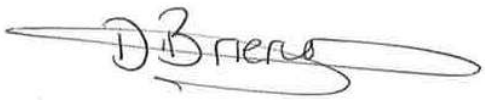
Amendments: Request for Additional Analysis

Envirolab Job Number: 22/06752
Issue Number: 2 **Date:** 23 August, 2022

Client:
RSK Environment Ltd Bristol
The Old School
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: Rachael Lockyer
Project Name: Hallenbeagle
Project Ref: 315111
Order No: N/A
Date Samples Received: 11/07/22
Date Instructions Received: 11/07/22
Date Analysis Completed: 23/08/22

Approved by:



Danielle Brierley
Deputy Client Services Supervisor

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/1	22/06752/2	22/06752/3	22/06752/4	22/06752/5	22/06752/6	22/06752/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01b	TP02	TP03	TP06	TP05	TP07	TP08			
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50	2.6			
Depth To Bottom										
Date Sampled	04-Jul-22	04-Jul-22	04-Jul-22	04-Jul-22	05-Jul-22	05-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4AE	4ABE	4AE	4ABE	4AE	4AE	4ABE			
% Stones >10mm$_A$	15.8	23.8	46.4	19.9	37.3	8.0	7.0	% w/w	0.1	A-T-044
Total Organic Carbon$_D^{M\#}$	1.02	1.13	0.50	0.62	0.11	1.90	<0.03	% w/w	0.03	A-T-032s
Arsenic$_D^{M\#}$	1190	555	1350	274	129	449	39	mg/kg	1	A-T-024s
Cadmium$_D^{M\#}$	1.8	1.5	1.4	1.0	0.6	1.4	1.1	mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	380	328	748	129	71	244	24	mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	20	18	15	17	11	20	19	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead$_D^{M\#}$	78	71	65	30	12	55	23	mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	10	11	10	7	4	10	7	mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	416	343	334	177	91	236	254	mg/kg	5	A-T-024s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/1	22/06752/2	22/06752/3	22/06752/4	22/06752/5	22/06752/6	22/06752/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01b	TP02	TP03	TP06	TP05	TP07	TP08			
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50	2.6			
Depth To Bottom										
Date Sampled	04-Jul-22	04-Jul-22	04-Jul-22	04-Jul-22	05-Jul-22	05-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4AE	4ABE	4AE	4ABE	4AE	4AE	4ABE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_D^{\#}$	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/1	22/06752/2	22/06752/3	22/06752/4	22/06752/5	22/06752/6	22/06752/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01b	TP02	TP03	TP06	TP05	TP07	TP08			
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50	2.6			
Depth To Bottom										
Date Sampled	04-Jul-22	04-Jul-22	04-Jul-22	04-Jul-22	05-Jul-22	05-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4AE	4ABE	4AE	4ABE	4AE	4AE	4ABE			
PAH-16MS										
Acenaphthene$_A^{M\#}$	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	0.07	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	0.10	0.03	<0.02	0.11	<0.02	<0.02	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.86	0.12	0.10	0.13	<0.04	0.06	<0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	1.20	0.11	0.13	0.12	<0.04	0.07	<0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	1.46	0.14	0.16	0.15	<0.05	0.10	<0.05	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.72	0.05	0.09	0.07	<0.05	<0.05	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	0.54	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.89	0.14	0.12	0.13	<0.06	0.07	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	0.15	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	1.39	0.29	0.19	0.39	<0.08	0.13	<0.08	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	0.02	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.88	0.07	0.10	0.09	<0.03	0.05	<0.03	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.33	0.17	0.06	0.46	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	1.34	0.24	0.17	0.32	<0.07	0.11	<0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	9.97	1.36	1.12	2.07	<0.08	0.59	<0.08	mg/kg	0.01	A-T-019s
TPH Total with ID										
TPH total (>C6-C40)$_A^{M\#}$	-	33	-	-	-	63	<10	mg/kg	10	A-T-007s
TPH ID Interpretation$_A$	-	Profile indicative of humic substances	-	-	-	Profile indicative of humic substances	N/A			A-T-007s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/1	22/06752/2	22/06752/3	22/06752/4	22/06752/5	22/06752/6	22/06752/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP01b	TP02	TP03	TP06	TP05	TP07	TP08			
Depth to Top	0.50	0.50	0.50	0.50	0.50	0.50	2.6			
Depth To Bottom										
Date Sampled	04-Jul-22	04-Jul-22	04-Jul-22	04-Jul-22	05-Jul-22	05-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4AE	4ABE	4AE	4ABE	4AE	4AE	4ABE			
TPH CWG with Clean Up										
Ali >C5-C6$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	-	4	-	-	-	-	<1	mg/kg	1	A-T-055s
Total Aliphatics$_A$	-	4	-	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C5-C7$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	-	<1	-	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	-	2	-	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	-	9	-	-	-	-	<1	mg/kg	1	A-T-055s
Total Aromatics$_A$	-	11	-	-	-	-	<1	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35)$_A$	-	14	-	-	-	-	<1	mg/kg	1	A-T-055s
BTEX - Benzene$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	-	<0.01	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/9	22/06752/10	22/06752/11	22/06752/12	22/06752/13	22/06752/14	22/06752/15	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP10	TP14	TP04	TP13	BH1	BH2	TP12			
Depth to Top	0.5	0.5	0.50	0.50	0.50	0.50	1.40			
Depth To Bottom										
Date Sampled	05-Jul-22	05-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4ABE	4AE	6AE	4AE	4ABE	6AE	4A			
% Stones >10mm$_A$	4.4	43.1	<0.1	23.9	31.0	21.5	17.6	% w/w	0.1	A-T-044
Total Organic Carbon$_D^{M\#}$	1.32	0.84	1.97	2.28	0.86	1.88	<0.03	% w/w	0.03	A-T-032s
Arsenic$_D^{M\#}$	290	11400	1050	249	466	973	48	mg/kg	1	A-T-024s
Cadmium$_D^{M\#}$	1.1	<0.5	2.5	0.9	1.2	1.3	<0.5	mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	134	228	559	160	177	466	32	mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	18	13	22	15	14	16	7	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead$_D^{M\#}$	36	40	76	42	30	41	15	mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	8	17	13	7	10	7	2	mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	<1	1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	218	205	636	172	242	209	21	mg/kg	5	A-T-024s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/9	22/06752/10	22/06752/11	22/06752/12	22/06752/13	22/06752/14	22/06752/15	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP10	TP14	TP04	TP13	BH1	BH2	TP12			
Depth to Top	0.5	0.5	0.50	0.50	0.50	0.50	1.40			
Depth To Bottom										
Date Sampled	05-Jul-22	05-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4ABE	4AE	6AE	4AE	4ABE	6AE	4A			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_D^{\#}$	NAD	NAD	Chrysotile	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_D$	-	-	Loose Fibres	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_D$	-	-	0.005	-	-	-	-	% w/w	0.001	A-T-054

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/9	22/06752/10	22/06752/11	22/06752/12	22/06752/13	22/06752/14	22/06752/15	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP10	TP14	TP04	TP13	BH1	BH2	TP12			
Depth to Top	0.5	0.5	0.50	0.50	0.50	0.50	1.40			
Depth To Bottom										
Date Sampled	05-Jul-22	05-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4ABE	4AE	6AE	4AE	4ABE	6AE	4A			
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	0.02	<0.01	0.05	<0.01	<0.01	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	0.06	<0.02	0.12	<0.02	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.04	0.06	0.43	0.12	0.86	<0.04	<0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.06	0.07	0.55	0.12	1.13	<0.04	<0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.08	0.10	0.68	0.16	1.35	0.06	<0.05	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05	0.29	0.06	0.69	<0.05	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	0.25	<0.07	0.47	<0.07	<0.07	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	<0.06	0.08	0.46	0.13	0.86	<0.06	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	0.05	<0.04	0.12	<0.04	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.11	0.13	0.73	0.24	1.51	<0.08	<0.08	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.03	0.06	0.37	0.07	0.86	<0.03	<0.03	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.04	0.06	0.21	0.07	0.31	0.04	<0.03	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.10	0.12	0.67	0.21	1.44	<0.07	<0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	0.46	0.68	4.77	1.18	9.81	0.10	<0.08	mg/kg	0.01	A-T-019s
TPH Total with ID										
TPH total (>C6-C40)$_A^{M\#}$	-	-	-	-	233	-	-	mg/kg	10	A-T-007s
TPH ID Interpretation$_A$	-	-	-	-	Profile indicative of PAHs and other heavier unresolved hydrocarbons	-	-			A-T-007s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/9	22/06752/10	22/06752/11	22/06752/12	22/06752/13	22/06752/14	22/06752/15	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP10	TP14	TP04	TP13	BH1	BH2	TP12			
Depth to Top	0.5	0.5	0.50	0.50	0.50	0.50	1.40			
Depth To Bottom										
Date Sampled	05-Jul-22	05-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	4ABE	4AE	6AE	4AE	4ABE	6AE	4A			
TPH CWG with Clean Up										
Ali >C5-C6$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	-	-	-	13	-	-	-	mg/kg	1	A-T-055s
Total Aliphatics$_A$	-	-	-	13	-	-	-	mg/kg	1	A-T-055s
Aro >C5-C7$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	-	-	-	<1	-	-	-	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	-	-	-	5	-	-	-	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	-	-	-	14	-	-	-	mg/kg	1	A-T-055s
Total Aromatics$_A$	-	-	-	19	-	-	-	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35)$_A$	-	-	-	33	-	-	-	mg/kg	1	A-T-055s
BTEX - Benzene$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	-	-	-	<0.01	-	-	-	mg/kg	0.01	A-T-022s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/22	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP01	HP01	HP02	HP02	HP03	HP03	TP015			
Depth to Top	0.40	0.80	0.50	0.80	0.40	0.80	0.50			
Depth To Bottom										
Date Sampled	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	5AE	4AE	4AE	4AE	4AE	4AE	4AE			
% Stones >10mm$_A$	9.7	12.4	8.4	15.7	26.8	<0.1	28.8	% w/w	0.1	A-T-044
Total Organic Carbon$_D^{M\#}$	2.53	2.44	2.67	2.27	1.48	1.98	1.19	% w/w	0.03	A-T-032s
Arsenic$_D^{M\#}$	541	572	479	486	632	646	235	mg/kg	1	A-T-024s
Cadmium$_D^{M\#}$	1.1	1.1	1.3	1.2	1.0	1.6	0.9	mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	231	242	252	228	203	233	136	mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	17	16	20	17	16	19	15	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead$_D^{M\#}$	54	56	58	54	51	54	33	mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	9	8	10	8	10	11	6	mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	<1	<1	<1	3	<1	<1	<1	mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	226	199	256	219	227	266	150	mg/kg	5	A-T-024s

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/22	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP01	HP01	HP02	HP02	HP03	HP03	TP015			
Depth to Top	0.40	0.80	0.50	0.80	0.40	0.80	0.50			
Depth To Bottom										
Date Sampled	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	5AE	4AE	4AE	4AE	4AE	4AE	4AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_D^{\#}$	NAD	NAD	NAD	NAD	NAD	Chrysotile	NAD			A-T-045
Asbestos Matrix (visual)$_D$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_D$	-	-	-	-	-	Loose Fibres	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_D$	-	-	-	-	-	<0.001	-	% w/w	0.001	A-T-054

Envirolab Job Number: 22/06752

Client Project Name: Hallenbeagle

Client Project Ref: 315111

Lab Sample ID	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/22	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP01	HP01	HP02	HP02	HP03	HP03	TP015			
Depth to Top	0.40	0.80	0.50	0.80	0.40	0.80	0.50			
Depth To Bottom										
Date Sampled	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	5AE	4AE	4AE	4AE	4AE	4AE	4AE			
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	0.03	<0.02	0.02	<0.02	<0.02	0.03	<0.02	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.12	<0.04	0.11	0.05	0.11	0.12	0.04	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.12	<0.04	0.11	0.06	0.12	0.12	0.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.17	0.06	0.15	0.08	0.15	0.16	0.06	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.08	<0.05	0.05	<0.05	0.08	0.10	<0.05	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.14	<0.06	0.12	0.07	0.12	0.15	<0.06	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.26	0.10	0.25	0.12	0.23	0.27	0.09	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.09	<0.03	0.07	0.04	0.09	0.10	0.03	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.10	0.03	0.15	0.05	0.08	0.11	0.03	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.21	0.08	0.19	0.10	0.19	0.23	0.07	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	1.32	0.27	1.22	0.57	1.17	1.42	0.36	mg/kg	0.01	A-T-019s
TPH Total with ID										
TPH total (>C6-C40)$_A^{M\#}$	-	-	-	-	71	-	14	mg/kg	10	A-T-007s
TPH ID Interpretation$_A$	-	-	-	-	Profile indicative of PAHs and other heavier unresolved hydrocarbons	-	Concentration too low to identify			A-T-007s

Envirolab Job Number: 22/06752 **Client Project Name: Hallenbeagle**

Client Project Ref: 315111

Lab Sample ID	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/22	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP01	HP01	HP02	HP02	HP03	HP03	TP015			
Depth to Top	0.40	0.80	0.50	0.80	0.40	0.80	0.50			
Depth To Bottom										
Date Sampled	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	06-Jul-22	05-Jul-22			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Sample Matrix Code	5AE	4AE	4AE	4AE	4AE	4AE	4AE			
TPH CWG with Clean Up										
Ali >C5-C6$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	-	-	11	-	-	-	4	mg/kg	1	A-T-055s
Total Aliphatics$_A$	-	-	11	-	-	-	4	mg/kg	1	A-T-055s
Aro >C5-C7$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	-	-	<1	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	-	-	4	-	-	-	<1	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	-	-	15	-	-	-	3	mg/kg	1	A-T-055s
Total Aromatics$_A$	-	-	19	-	-	-	3	mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35)$_A$	-	-	30	-	-	-	7	mg/kg	1	A-T-055s
BTEX - Benzene$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	-	-	<0.01	-	-	-	<0.01	mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: RSK Environment Ltd Bristol, The Old School, Stillhouse Lane, Bedminster, Bristol, UK, BS3 4EB

Project: Hallenbeagle

Clients Project No: 315111

Project No: 22/06752

Date Received: 11/07/2022 (am)

Cool Box Temperatures (°C): 16.4 - 16.8

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples 5 ± 3°C), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	22/06752/1	22/06752/2	22/06752/3	22/06752/4	22/06752/5	22/06752/6	22/06752/7	22/06752/9	22/06752/10	22/06752/11	22/06752/12	22/06752/13
Client Sample No												
Client Sample ID/Depth	TP01b 0.50m	TP02 0.50m	TP03 0.50m	TP06 0.50m	TP05 0.50m	TP07 0.50m	TP08 2.6m	TP10 0.5m	TP14 0.5m	TP04 0.50m	TP13 0.50m	BH1 0.50m
Date Sampled	04/07/22	04/07/22	04/07/22	04/07/22	05/07/22	05/07/22	05/07/22	05/07/22	05/07/22	06/07/22	06/07/22	06/07/22
A-T-004s												
A-T-007s		15/07/2022				15/07/2022	15/07/2022					15/07/2022
A-T-019s	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
A-T-022s		19/07/2022					19/07/2022				19/07/2022	
A-T-024s	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
A-T-025w												
A-T-026w												
A-T-030s												
A-T-031s												
A-T-031w												
A-T-032s	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	25/07/2022	22/07/2022	22/07/2022
A-T-032w												
A-T-037w												
A-T-040s	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
A-T-044	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022
A-T-045	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
A-T-050w												
A-T-054										23/08/2022		
A-T-055s		19/07/2022					19/07/2022				19/07/2022	
A-T-ANCs												
Calc												
Calc-no stones												
Probe (w)												

Lab Sample ID	22/06752/14	22/06752/15	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/22
Client Sample No									
Client Sample ID/Depth	BH2 0.50m	TP12 1.40m	HP01 0.40m	HP01 0.80m	HP02 0.50m	HP02 0.80m	HP03 0.40m	HP03 0.80m	TP015 0.50m
Date Sampled	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	05/07/22
A-T-004s			15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	
A-T-007s			18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022	18/07/2022	15/07/2022
A-T-019s	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
A-T-022s			19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022	19/07/2022
A-T-024s	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022
A-T-025w			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-026w			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-030s			21/07/2022	21/07/2022	21/07/2022	21/07/2022	21/07/2022	13/07/2022	
A-T-031s			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-031w			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-032s	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	25/07/2022	22/07/2022
A-T-032w			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-037w			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-040s	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
A-T-044	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022	15/07/2022
A-T-045	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022	13/07/2022
A-T-050w			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
A-T-054								23/08/2022	
A-T-055s					19/07/2022				19/07/2022
A-T-ANCs			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
Calc			12/07/2022	12/07/2022	12/07/2022	12/07/2022	12/07/2022	12/07/2022	
Calc-no stones			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	
Probe (w)			22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	22/07/2022	

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

APPENDIX I
GENERIC ASSESSMENT CRITERIA FOR COMMERCIAL USE

Generic assessment criteria for human health: commercial scenario

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009[1]. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009[2]. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)[3,4], as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)[5] used in the generation of SGVs.

C4SL were initially published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010[3]). Further C4SL were published in 2021 for vinyl chloride, tetrachloroethene (PCE) and trichloroethene (TCE). Where a C4SL has been published, the RSK GAC duplicates the C4SL using all input parameters within the SP1010 final project report[3] and associated chemical specific reports[6], and adopts them as GAC for these substances. Due to the use of decimal places rather than significant figures applied to the Contaminated Land Exposure Assessment (CLEA) tool outputs, the GAC presented may be marginally differently to the C4SL values, however any differences between the values are minimal and would not equate to an unacceptable risk.

For all other substances the only C4SL exposure modification relevant to a commercial end use are daily inhalation rates.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015[7] or by the USEPA[14], where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the CLEA tool v1.071, supporting EA guidance[5,8,9] and revised exposure scenarios published for the C4SL[3]. The SAC are also termed GAC.

Pathway selection

In accordance with SR3[5] the commercial scenario considers risks to a female worker who works from the age of 16 to 65 years. It should be noted that this end use is not suitable for a workplace nursery but may be appropriate for a sports centre or shopping centre where children are present. In accordance with Box 3.5, SR3[5] the pathways considered for production of the SAC in the commercial scenario are

- direct soil and dust ingestion

- dermal contact with soil both indoors and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase[9]. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached[9]. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required[9]:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook[9], this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook[9], which explains how to calculate an effective assessment criterion manually.

SR3[5] states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7[10], the EA TOX[1] reports, the C4SL SP1010 project report and associated chemical specific reports[3,6], the 2015 LQM/CIEH report[7] or the USEPA IRIS database[14]. Where a LLTC[3,6] has been published for a substance, RSK has used these input parameters to derive the RSK GAC. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium, methyl tertiary-butyl ether (MTBE), 1,1,2-trichlorethane, 1,1-dichloroethene, 1,2-dichloropropane, 2-chloronaphthalene, chloroethane, chloromethane, cis 1,2-dichloroethene, dichloromethane, hexachloroethane and trans 1,2-dichloroethene were obtained from the CL:AIRE Soil Generic Assessment Criteria report[11].

For TPH, aromatic hydrocarbons C_5–C_8 were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3[5] notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The default input building parameters presented in Table 3.10 of SR3[5] have been used.

The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3[5]. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3[5] input parameters for a commercial land use

In summary, the RSK commercial GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3[5]. Modifications to the default SR3[5] exposure scenarios based on the C4SL exposure scenarios[3] are presented in Table 2 below. The sole modification to the default commercial input parameters is the updated inhalation rate.

The final selected GAC are presented by pathway in Table 3 with the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA commercial scenario

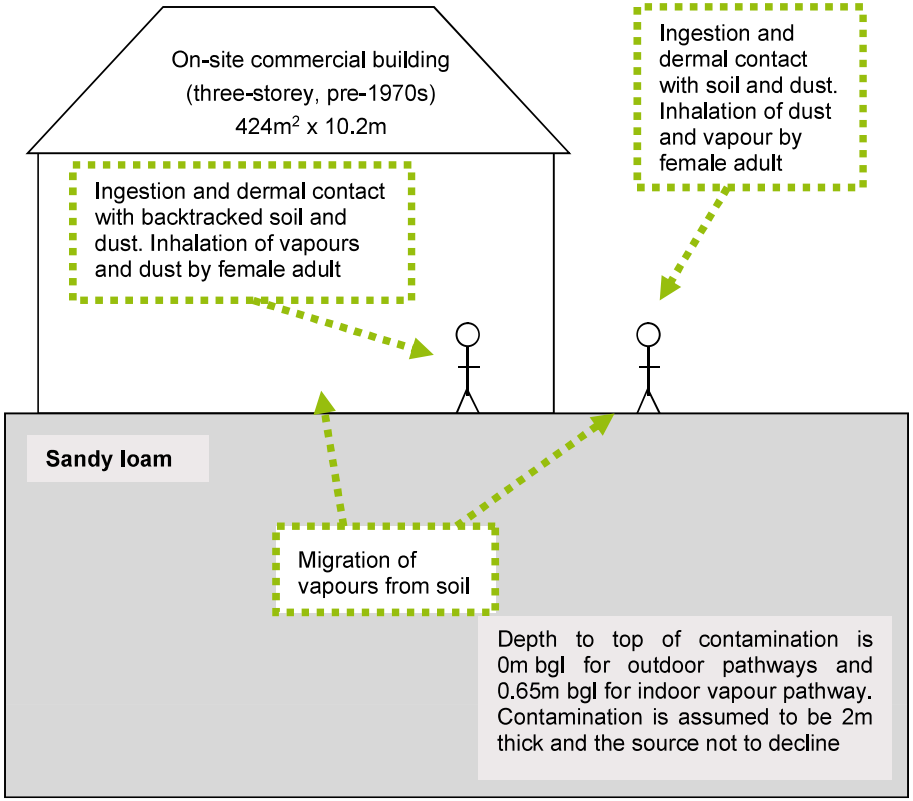


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3[5]
Building	Office (pre-1970)	Key generic assumption given in Box 3.5, SR3[5]. Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3[5])
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3[5])
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65 years. Assumption given in Box 3.5, SR3[5]
End AC	17	
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'[13]
	1	To provide SAC for sites where SOM < 6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Commercial – modified receptor inputs

Parameter	Unit	Value	Justification
Inhalation rate (AC17)	m^3 day^{-1}	15.7	Mean value USEPA, 2011[12]; Table 3.2, SP1010[3]

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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	6.35E+02	1.25E+03	NR	NR	6.35E+02	1.25E+03	NR	NR	6.35E+02	1.25E+03	NR	NR
Barium	(b)	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR
Beryllium		3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR
Boron		2.38E+05	2.82E+07	NR	NR	2.38E+05	2.82E+07	NR	NR	2.38E+05	2.82E+07	NR	NR
Cadmium	(a)	7.73E+02	8.57E+02	4.10E+02	NR	7.73E+02	8.57E+02	4.10E+02	NR	7.73E+02	8.57E+02	4.10E+02	NR
Chromium (III) - trivalent	(c)	3.31E+05	8.57E+03	NR	NR	3.31E+05	8.57E+03	NR	NR	3.31E+05	8.57E+03	NR	NR
Chromium (VI) - hexavalent	(a,d)	9.62E+02	4.91E+01	NR	NR	9.62E+02	4.91E+01	NR	NR	9.62E+02	4.91E+01	NR	NR
Copper		1.89E+05	8.96E+04	6.83E+04	NR	1.89E+05	8.96E+04	6.83E+04	NR	1.89E+05	8.96E+04	6.83E+04	NR
Lead	(a)	2.32E+03	NR	NR	NR	2.32E+03	NR	NR	NR	2.32E+03	NR	NR	NR
Elemental Mercury (Hg^0)	(d)	NR	1.54E+01	NR	4.31E+00	NR	3.26E+01	NR	1.07E+01	NR	5.80E+01	NR	2.58E+01
Inorganic Mercury (Hg^{2+})		1.18E+03	1.97E+04	1.12E+03	NR	1.18E+03	1.97E+04	1.12E+03	NR	1.18E+03	1.97E+04	1.12E+03	NR
Methyl Mercury (Hg^{4+})		3.38E+02	2.13E+03	2.92E+02	7.33E+01	3.38E+02	3.87E+03	3.11E+02	1.42E+02	3.38E+02	7.33E+03	3.23E+02	3.04E+02
Nickel	(d)	3.06E+03	9.83E+02	NR	NR	3.06E+03	9.83E+02	NR	NR	3.06E+03	9.83E+02	NR	NR
Selenium	(b)	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR
Vanadium		2.15E+04	9.03E+03	NR	NR	2.15E+04	9.03E+03	NR	NR	2.15E+04	9.03E+03	NR	NR
Zinc	(b)	7.35E+05	1.97E+08	NR	NR	7.35E+05	1.97E+08	NR	NR	7.35E+05	1.97E+08	NR	NR
Cyanide (free)		6.56E+02	7.51E+04	6.53E+02	NR	6.56E+02	7.51E+04	6.53E+02	NR	6.56E+02	7.51E+04	6.53E+02	NR
Volatile Organic Compounds													
Benzene	(a)	1.09E+03	2.79E+01	2.72E+01	1.22E+03	1.09E+03	5.19E+01	4.96E+01	2.26E+03	1.09E+03	1.08E+02	9.80E+01	4.71E+03
Toluene		4.24E+05	6.49E+04	5.63E+04	8.69E+02	4.24E+05	1.43E+05	1.07E+05	1.92E+03	4.24E+05	3.24E+05	1.84E+05	4.36E+03
Ethylbenzene		1.91E+05	5.89E+03	5.71E+03	5.18E+02	1.91E+05	1.38E+04	1.28E+04	1.22E+03	1.91E+05	3.21E+04	2.75E+04	2.84E+03
Xylene - m		3.43E+05	6.26E+03	6.15E+03	6.25E+02	3.43E+05	1.47E+04	1.41E+04	1.47E+03	3.43E+05	3.44E+04	3.12E+04	3.46E+03
Xylene - o		3.43E+05	6.73E+03	6.60E+03	4.78E+02	3.43E+05	1.57E+04	1.50E+04	1.12E+03	3.43E+05	3.65E+04	3.30E+04	2.62E+03
Xylene - p		3.43E+05	6.03E+03	5.92E+03	5.76E+02	3.43E+05	1.41E+04	1.36E+04	1.35E+03	3.43E+05	3.28E+04	3.00E+04	3.17E+03
Total xylene		3.43E+05	6.03E+03	5.92E+03	6.25E+02	3.43E+05	1.41E+04	1.36E+04	1.47E+03	3.43E+05	3.28E+04	3.00E+04	3.46E+03
Methyl tertiary-Butyl ether (MTBE)		5.72E+05	7.58E+03	7.48E+03	2.04E+04	5.72E+05	1.23E+04	1.21E+04	3.31E+04	5.72E+05	2.34E+04	2.24E+04	6.27E+04
1,1,1,2 Tetrachloroethane		1.10E+04	1.09E+02	1.08E+02	2.60E+03	1.10E+04	2.53E+02	2.47E+02	6.02E+03	1.10E+04	5.88E+02	5.59E+02	1.40E+04
1,1,2,2-Tetrachloroethane		1.10E+04	2.81E+02	2.74E+02	2.67E+03	1.10E+04	5.75E+02	5.46E+02	5.46E+03	1.10E+04	1.26E+03	1.13E+03	1.20E+04
1,1,1-Trichloroethane		1.14E+06	6.60E+02	6.60E+02	1.43E+03	1.14E+06	1.35E+03	1.35E+03	2.92E+03	1.14E+06	2.96E+03	2.95E+03	6.39E+03
1,1,2 Trichloroethane		7.62E+03	9.02E+01	8.91E+01	4.03E+03	7.62E+03	1.84E+02	1.80E+02	8.21E+03	7.62E+03	4.02E+02	3.82E+02	1.80E+04
1,1-Dichloroethene		8.76E+04	2.43E+01	2.43E+01	2.23E+03	8.76E+04	4.30E+01	4.30E+01	3.94E+03	8.76E+04	8.68E+01	8.67E+01	7.94E+03
1,2-Dichloroethane		2.29E+02	6.73E-01	6.71E-01	3.41E+03	2.29E+02	9.71E-01	9.67E-01	4.91E+03	2.29E+02	1.67E+00	1.65E+00	8.43E+03
1,2,4-Trimethylbenzene		NR	3.29E+02	NR	4.74E+02	NR	6.41E+02	NR	1.16E+03	NR	1.04E+03	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane		2.57E+04	3.14E+00	3.13E+00	1.19E+03	2.57E+04	5.54E+00	5.54E+00	2.11E+03	2.57E+04	1.11E+01	1.11E+01	4.24E+03
Carbon Tetrachloride (tetrachloromethane)		7.62E+03	2.87E+00	2.87E+00	1.52E+03	7.62E+03	6.29E+00	6.28E+00	3.32E+03	7.62E+03	1.43E+01	1.42E+01	7.54E+03
Chloroethane		NR	9.01E+02	NR	2.61E+03	NR	1.22E+03	NR	3.54E+03	NR	1.97E+03	NR	5.71E+03
Chloromethane		NR	9.54E-01	NR	1.91E+03	NR	1.11E+00	NR	2.24E+03	NR	1.49E+00	NR	2.99E+03
Cis 1,2 Dichloroethene		1.36E+01	NR	NR	3.94E+03	2.29E+01	NR	NR	6.61E+03	4.44E+01	NR	NR	1.29E+04
Dichloromethane		9.04E+03	2.63E+02	2.57E+02	7.27E+03	9.04E+03	3.50E+02	3.39E+02	9.68E+03	9.04E+03	5.53E+02	5.26E+02	1.53E+04
Tetrachloroethene (PCE)		2.67E+04	2.45E+01	2.45E+01	4.24E+02	2.67E+04	5.49E+01	5.48E+01	9.51E+02	2.67E+04	1.26E+02	1.25E+02	2.18E+03
Trans 1,2 Dichloroethene		3.23E+04	2.07E+01	NR	3.42E+03	3.23E+04	3.74E+01	NR	6.17E+03	3.23E+04	7.63E+01	NR	1.26E+04
Trichloroethene (TCE)		7.30E-01	2.59E+00	NR	1.54E+03	1.53E+00	5.43E+00	NR	3.22E+03	3.38E+00	1.20E+01	NR	7.14E+03
Vinyl Chloride (chloroethene)		1.19E+02	1.13E+00	1.12E+00	1.36E+03	1.19E+02	1.46E+00	1.45E+00	1.76E+03	1.19E+02	2.24E+00	2.20E+00	2.69E+03
Semi-Volatile Organic Compounds													
2-Chloronaphthalene		1.53E+05	3.71E+02	3.70E+02	1.14E+02	1.53E+05	9.07E+02	9.02E+02	2.80E+02	1.53E+05	2.13E+03	2.10E+03	6.69E+02
Acenaphthene		1.10E+05	2.75E+06	1.06E+05	5.70E+01	1.10E+05	5.36E+06	1.08E+05	1.41E+02	1.10E+05	8.83E+06	1.08E+05	3.36E+02

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Notes	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Acenaphthylene		1.10E+05	2.68E+06	1.05E+05	8.61E+01	1.10E+05	5.23E+06	1.07E+05	2.12E+02	1.10E+05	8.65E+06	1.08E+05	5.06E+02
Anthracene		5.49E+05	1.13E+07	5.23E+05	1.17E+00	5.49E+05	2.35E+07	5.36E+05	2.91E+00	5.49E+05	4.13E+07	5.42E+05	6.96E+00
Benzo(a)anthracene		2.84E+02	4.08E+02	1.67E+02	1.71E+00	2.84E+02	4.47E+02	1.74E+02	4.28E+00	2.84E+02	4.67E+02	1.76E+02	1.03E+01
Benzo(a)pyrene	(a)	7.68E+01	2.04E+02	5.58E+01	9.11E-01	7.68E+01	2.09E+02	5.61E+01	2.28E+00	7.68E+01	2.11E+02	5.63E+01	5.46E+00
Benzo(b)fluoranthene		7.13E+01	1.17E+02	4.43E+01	1.22E+00	7.13E+01	1.20E+02	4.47E+01	3.04E+00	7.13E+01	1.21E+02	4.49E+01	7.29E+00
Benzo(g,h,i)perylene		6.29E+03	1.05E+04	3.93E+03	1.54E-02	6.29E+03	1.06E+04	3.95E+03	3.85E-02	6.29E+03	1.07E+04	3.96E+03	9.23E-02
Benzo(k)fluoranthene		1.88E+03	3.11E+03	1.17E+03	6.87E-01	1.88E+03	3.17E+03	1.18E+03	1.72E+00	1.88E+03	3.21E+03	1.19E+03	4.12E+00
Chrysene		5.67E+02	8.89E+02	3.46E+02	4.40E-01	5.67E+02	9.25E+02	3.52E+02	1.10E+00	5.67E+02	9.47E+02	3.55E+02	2.64E+00
Dibenzo(a,h)anthracene		5.67E+00	9.32E+00	3.53E+00	3.93E-03	5.67E+00	9.52E+00	3.55E+00	9.82E-03	5.67E+00	9.64E+00	3.57E+00	2.36E-02
Fluoranthene		2.29E+04	1.89E+06	2.26E+04	1.89E+01	2.29E+04	2.72E+06	2.27E+04	4.73E+01	2.29E+04	3.32E+06	2.27E+04	1.13E+02
Fluorene		7.31E+04	4.55E+05	6.30E+04	3.09E+01	7.31E+04	1.06E+06	6.84E+04	7.65E+01	7.31E+04	2.24E+06	7.08E+04	1.83E+02
Hexachloroethane		2.09E+01	NR	NR	8.17E+00	4.98E+01	NR	NR	2.01E+01	1.11E+02	NR	NR	4.81E+01
Indeno(1,2,3-cd)pyrene		8.10E+02	1.31E+03	5.01E+02	6.13E-02	8.10E+02	1.35E+03	5.06E+02	1.53E-01	8.10E+02	1.37E+03	5.09E+02	3.68E-01
Naphthalene		3.64E+04	1.87E+03	1.78E+03	7.64E+01	3.64E+04	4.39E+03	3.92E+03	1.83E+02	3.64E+04	9.94E+03	7.81E+03	4.32E+02
Phenanthrene		2.28E+04	5.35E+05	2.19E+04	3.60E+01	2.28E+04	1.09E+06	2.24E+04	8.96E+01	2.28E+04	1.86E+06	2.25E+04	2.14E+02
Pyrene		5.49E+04	4.47E+06	5.42E+04	2.20E+00	5.49E+04	6.46E+06	5.44E+04	5.49E+00	5.49E+04	7.91E+06	5.45E+04	1.32E+01
Phenol		1.10E+06	2.65E+04	2.59E+04	2.42E+04	1.10E+06	3.04E+04	2.96E+04	3.81E+04	1.10E+06	3.46E+04	3.35E+04	7.03E+04
Total petroleum hydrocarbons													
Aliphatic hydrocarbons EC5-EC6		4.77E+06	3.19E+03	3.19E+03	3.04E+02	4.77E+06	5.86E+03	5.86E+03	5.58E+02	4.77E+06	1.21E+04	1.21E+04	1.15E+03
Aliphatic hydrocarbons >EC6-EC8		4.77E+06	7.79E+03	7.78E+03	1.44E+02	4.77E+06	1.74E+04	1.74E+04	3.22E+02	4.77E+06	3.97E+04	3.96E+04	7.36E+02
Aliphatic hydrocarbons >EC8-EC10		9.53E+04	2.02E+03	2.00E+03	7.77E+01	9.53E+04	4.91E+03	4.85E+03	1.90E+02	9.53E+04	1.17E+04	1.13E+04	4.51E+02
Aliphatic hydrocarbons >EC10-EC12		9.53E+04	9.97E+03	9.69E+03	4.75E+01	9.53E+04	2.47E+04	2.29E+04	1.18E+02	9.53E+04	5.89E+04	4.73E+04	2.83E+02
Aliphatic hydrocarbons >EC12-EC16		9.53E+04	8.26E+04	5.88E+04	2.37E+01	9.53E+04	2.04E+05	8.17E+04	5.91E+01	9.53E+04	4.81E+05	9.02E+04	1.42E+02
Aliphatic hydrocarbons >EC16-EC35	(b)	1.58E+06	NR	NR	8.48E+00	1.75E+06	NR	NR	2.12E+01	1.83E+06	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC35-EC44	(b)	1.58E+06	NR	NR	8.48E+00	1.75E+06	NR	NR	2.12E+01	1.83E+06	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC10		3.81E+04	3.55E+03	3.46E+03	6.13E+02	3.81E+04	8.66E+03	8.11E+03	1.50E+03	3.81E+04	2.05E+04	1.70E+04	3.58E+03
Aromatic hydrocarbons >EC10-EC12		3.81E+04	1.92E+04	1.62E+04	3.64E+02	3.81E+04	4.69E+04	2.79E+04	8.99E+02	3.81E+04	1.10E+05	3.42E+04	2.15E+03
Aromatic hydrocarbons >EC12-EC16		3.81E+04	2.02E+05	3.62E+04	1.69E+02	3.81E+04	4.76E+05	3.73E+04	4.19E+02	3.81E+04	1.03E+06	3.78E+04	1.00E+03
Aromatic hydrocarbons >EC16-EC21	(b)	2.82E+04	NR	NR	5.37E+01	2.83E+04	NR	NR	1.34E+02	2.84E+04	NR	NR	3.21E+02
Aromatic hydrocarbons >EC21-EC35	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	2.90E+01
Aromatic hydrocarbons >EC35-EC44	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	2.90E+01

Notes:

EC - equivalent carbon. GrAC - groundwater screening value. SAC - soil screening value.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.

Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for barium and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL

Table 4
Human Health Generic Assessment Criteria for Commercial Scenario

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	640	640	640
Barium	22,000	22,000	22,000
Beryllium	12	12	12
Boron	240,000	240,000	240,000
Cadmium	410	410	410
Chromium (III) - trivalent	8,600	8,600	8,600
Chromium (VI) - hexavalent	49	49	49
Copper	68,000	68,000	68,000
Lead	2,300	2,300	2,300
Elemental Mercury (Hg^0)	15 (4)	33 (11)	58 (26)
Inorganic Mercury (Hg^{2+})	1,120	1,120	1,120
Methyl Mercury (Hg^{4+})	290 (73)	310 (142)	320
Nickel	980	980	980
Selenium	12,000	12,000	12,000
Vanadium	9,000	9,000	9,000
Zinc	740,000	740,000	740,000
Cyanide (free)	650	650	650
Volatile Organic Compounds			
Benzene	27	50	98
Toluene	56,000 (869)	107,000 (1,916)	184,000 (4,357)
Ethylbenzene	6,000 (518)	13,000 (1,216)	27,000 (2,844)
Xylene - m	6,200 (625)	14,100 (1,474)	31,200 (3,457)
Xylene - o	6,600 (478)	15,000 (1,120)	33,000 (2,618)
Xylene - p	5,900 (576)	13,600 (1,353)	30,000 (3,167)
Total xylene	5,900 (625)	13,600 (1,474)	30,000 (3,457)
Methyl tertiary-Butyl ether (MTBE)	7,500	12,100	22,400
1,1,1,2 Tetrachloroethane	110	250	560
1,1,2,2-Tetrachloroethane	270	550	1,130
1,1,1-Trichloroethane	700	1,300	3,000
1,1,2 Trichloroethane	89	180	382
1,1-Dichloroethene	24	43	87
1,2-Dichloroethane	0.67	0.97	1.65
1,2,4-Trimethylbenzene	330	640	1,040
1,3,5-Trimethylbenzene	NR	NR	NR
1,2-Dichloropropane	3	6	11
Carbon Tetrachloride (tetrachloromethane)	2.9	6.3	14.2
Chloroethane	901	1,223	1,972
Chloromethane	1.0	1.1	1.5
Cis 1,2 Dichloroethene	14	23	44
Dichloromethane	257	339	526
Tetrachloroethene (PCE)	24	55	125
Trichloroethene (TCE)	0.7	1.5	3.4
Trans 1,2 Dichloroethene	21	37	76
Vinyl Chloride (chloroethene)	1.1	1.4	2.2
Semi-Volatile Organic Compounds			
2-Chloronaphthalene	370 (114)	902 (280)	2,098 (669)
Acenaphthene	110,000	110,000	110,000
Acenaphthylene	110,000	110,000	110,000
Anthracene	520,000	540,000	540,000
Benzo(a)anthracene	170	170	180
Benzo(a)pyrene	77	77	77
Benzo(b)fluoranthene	44	45	45
Benzo(g,h,i)perylene	3,900	3,900	4,000
Benzo(k)fluoranthene	1,200	1,200	1,200
Chrysene	350	350	350
Dibenzo(a,h)anthracene	3.5	3.6	3.6
Fluoranthene	23,000	23,000	23,000
Fluorene	63,000 (31)	68,000	71,000
Hexachloroethane	21 (8)	50 (20)	111 (48)
Indeno(1,2,3-cd)pyrene	500	510	510
Naphthalene	1,800 (76)	3,900 (183)	7,800 (432)
Phenanthrene	22,000	22,000	23,000
Pyrene	54,000	54,000	54,000
Phenol	440*	690*	1,300*
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC_5-EC_6	3,200 (304)	5,900 (558)	12,100 (1,150)
Aliphatic hydrocarbons >EC_6-EC_8	7,800 (144)	17,400 (322)	39,600 (736)
Aliphatic hydrocarbons >EC_8-EC_{10}	2,000 (78)	4,800 (190)	11,300 (451)
Aliphatic hydrocarbons >EC_{10}-EC_{12}	9,700 (48)	22,900 (118)	47,300 (283)
Aliphatic hydrocarbons >EC_{12}-EC_{16}	59,000 (24)	82,000 (59)	90,000 (142)
Aliphatic hydrocarbons >EC_{16}-EC_{35}	1,000,000**	1,000,000**	1,000,000**
Aliphatic hydrocarbons >EC_{35}-EC_{44}	1,000,000**	1,000,000**	1,000,000**
Aromatic hydrocarbons >EC_8-EC_{10}	3,500 (613)	8,100 (1,503)	17,000 (3,580)
Aromatic hydrocarbons >EC_{10}-EC_{12}	16,000 (364)	28,000 (899)	34,000 (2,150)
Aromatic hydrocarbons >EC_{12}-EC_{16}	36,000 (169)	37,000	38,000
Aromatic hydrocarbons >EC_{16}-EC_{21}	28,000	28,000	28,000
Aromatic hydrocarbons >EC_{21}-EC_{35}	28,000	28,000	28,000
Aromatic hydrocarbons >EC_{35}-EC_{44}	28,000	28,000	28,000
Minerals			
Asbestos	Stage 1 test – No asbestos detected with ID; Stage 2 test - <0.001% dry weight (exceedance of either equates to an exceedance of the GAC)[1]		

Notes:
'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data. SAC for 1,2,4 trimethylbenzene may be used
EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.
* The GAC for Phenol is based on a threshold which is protective of direct contact (SC050021/Phenol SGV report)
** Denoted SAC calculated exceeds 100% contaminant, hence 100% (1,000,000mg/kg) has been taken as SAC

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs napthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

(VALUE IN BRACKETS)
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.

APPENDIX J
GENERIC ASSESSMENT CRITERIA POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75 m below finished ground levels, sample results from depths between 0.50 m and 1.50 m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5 m below the proposed depth of the pipe.

It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table Q1: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	PE	PVC
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	• BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C_5–C_{10}) (Not including compounds within group 2e and 2f)	2	1.4
2e	• Phenols	2	0.4
2f	• Cresols and chlorinated phenols	2	0.04
3	Mineral oil C_{11}–C_{20}	10	Suitable
4	Mineral oil C_{21}–C_{40}	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			

APPENDIX K
GQRA DATA SCREENING TABLES - SOILS

Project name	Hallenbeagle
Project code	315111
Client name	Suez Recycling and Recovery Ltd UK
Address	Land at Hallenbeagle, Scorrier, Redruth Cornwall TR16 5BN
NGR	172714, 044783
Land use	Commercial Scenario
SOM	1%
GAC version	2019_00

Notes: Natural strata

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects		
Lab sample ID									22/06752/7	22/06752/15
Client sample ID									TP08	TP12
Depth to top									2.6	1.4
Depth to bottom										
Date sampled									05/07/22	06/07/22
Metals and Inorganics										
Arsenic	mg/kg	640		48	39	2	2	0	39	48
Cadmium	mg/kg	410		1.1	<0.5	2	1	1	1.1	<0.5
Chromium	mg/kg	8600	49	19	7	2	2	0	19	7
Chromium (hexavalent)	mg/kg	49			<1	2	0	2	<1	<1
Copper	mg/kg	68000		32	24	2	2	0	24	32
Lead	mg/kg	2300		23	15	2	2	0	23	15
Mercury	mg/kg	1120	15		<0.17	2	0	2	<0.17	<0.17
Nickel	mg/kg	980		7	2	2	2	0	7	2
Selenium	mg/kg	12000			<1	2	0	2	<1	<1
Zinc	mg/kg	740000		254	21	2	2	0	254	21
Asbestos										
Asbestos in soil						2	0	2	NAD	NAD
Asbestos Matrix (microscope)						2	0	2	-	-
Petroleum Hydrocarbons										
Ali >C5-C6	mg/kg	3200	304		<0.01	1	0	1	<0.01	
Ali >C6-C8	mg/kg	7800	144		<0.01	1	0	1	<0.01	
Ali >C8-C10	mg/kg	2000	78		<1	1	0	1	<1	
Ali >C10-C12	mg/kg	9700	48		<1	1	0	1	<1	
Ali >C12-C16	mg/kg	59000	24		<1	1	0	1	<1	
Ali >C16-C21	mg/kg				<1	1	0	1	<1	
Ali >C21-C35	mg/kg				<1	1	0	1	<1	
Ali >C16-C35 calculated	mg/kg	1000000			<1	1	0	1	<1	
Total Aliphatics	mg/kg				<1	1	0	1	<1	
Aro >C5-C7	mg/kg				<0.01	1	0	1	<0.01	
Aro >C7-C8	mg/kg				<0.01	1	0	1	<0.01	
Aro >C8-C10	mg/kg	3500	613		<1	1	0	1	<1	
Aro >C10-C12	mg/kg	16000	364		<1	1	0	1	<1	
Aro >C12-C16	mg/kg	36000	169		<1	1	0	1	<1	
Aro >C16-C21	mg/kg	28000			<1	1	0	1	<1	
Aro >C21-C35	mg/kg	28000			<1	1	0	1	<1	
Total Aromatics	mg/kg				<1	1	0	1	<1	
TPH (Ali & Aro)	mg/kg				<1	1	0	1	<1	
BTEX - Benzene	mg/kg	27			<0.01	1	0	1	<0.01	
BTEX - Toluene	mg/kg	56000	869		<0.01	1	0	1	<0.01	
BTEX - Ethyl Benzene	mg/kg	6000	518		<0.01	1	0	1	<0.01	
BTEX - o Xylene	mg/kg	6600	478		<0.01	1	0	1	<0.01	
BTEX - m & p Xylene	mg/kg	5900	576		<0.01	1	0	1	<0.01	
MTBE	mg/kg	7500			<0.01	1	0	1	<0.01	
TPH total (>C6-C40)	mg/kg				<10	1	0	1	<10	
TPH ID (for FID characterisations)						1			N/A	
Polycyclic aromatic hydrocarbons										

								Lab sample ID	22/06752/7	22/06752/15									
								Client sample ID	TP08	TP12									
								Depth to top	2.6	1.4									
								Depth to bottom											
								Date sampled	05/07/22	06/07/22									
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects											
Acenaphthene	mg/kg	110000			<0.01	2	0	2	<0.01	<0.01									
Acenaphthylene	mg/kg	110000			<0.01	2	0	2	<0.01	<0.01									
Anthracene	mg/kg	520000			<0.02	2	0	2	<0.02	<0.02									
Benzo(a)anthracene	mg/kg	170			<0.04	2	0	2	<0.04	<0.04									
Benzo(a)pyrene	mg/kg	77			<0.04	2	0	2	<0.04	<0.04									
Benzo(b)fluoranthene	mg/kg	44			<0.05	2	0	2	<0.05	<0.05									
Benzo(ghi)perylene	mg/kg	3900			<0.05	2	0	2	<0.05	<0.05									
Benzo(k)fluoranthene	mg/kg	1200			<0.07	2	0	2	<0.07	<0.07									
Chrysene	mg/kg	350			<0.06	2	0	2	<0.06	<0.06									
Dibenzo(ah)anthracene	mg/kg	3.5			<0.04	2	0	2	<0.04	<0.04									
Fluoranthene	mg/kg	23000			<0.08	2	0	2	<0.08	<0.08									
Fluorene	mg/kg	63000	31		<0.01	2	0	2	<0.01	<0.01									
Indeno(123-cd)pyrene	mg/kg	500			<0.03	2	0	2	<0.03	<0.03									
Naphthalene	mg/kg	1800	76		<0.03	2	0	2	<0.03	<0.03									
Phenanthrene	mg/kg	22000			<0.03	2	0	2	<0.03	<0.03									
Pyrene	mg/kg	54000			<0.07	2	0	2	<0.07	<0.07									
Total PAH-16MS	mg/kg				<0.08	2	0	2	<0.08	<0.08									
Other analytes																			
% Stones >10mm	% w/w			17.6	7	2	2	0	7	17.6									
Total Organic Carbon	% w/w				<0.03	2	0	2	<0.03	<0.03									
Converted to SOM (x / 0.58)	% w/w				<0.051724	2	0	2	<0.051724137	<0.0517241379									

Project name	Hallenbeagle
Project code	315111
Client name	Suez Recycling and Recovery Ltd UK
Address	Land at Hallenbeagle, Scorrier, Redruth Cornwall TR16 5BN
NGR	172714, 044783
Land use	Commercial Scenario
SOM	2.5%
GAC version	2019_00

Notes: Made Ground

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects	Lab sample ID									
									22/06752/13	22/06752/14	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/1	22/06752/2
									Client sample ID									
									BH1	BH2	HP01	HP01	HP02	HP02	HP03	HP03	TP01b	TP02
									Depth to top									
									0.5	0.5	0.4	0.8	0.5	0.8	0.4	0.8	0.5	0.5
									Depth to bottom									
									Date sampled									
									06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	04/07/22	04/07/22
Metals and Inorganics																		
Arsenic	mg/kg	640		11400	129	19	19	0	466	973	541	572	479	486	632	646	1190	555
Cadmium	mg/kg	410		2.5	<0.5	19	18	1	1.2	1.3	1.1	1.1	1.3	1.2	1	1.6	1.8	1.5
Chromium	mg/kg	8600	49	22	11	19	19	0	14	16	17	16	20	17	16	19	20	18
Chromium (hexavalent)	mg/kg	49			<1	19	0	19	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	mg/kg	68000		748	71	19	19	0	177	466	231	242	252	228	203	233	380	328
Lead	mg/kg	2300		78	12	19	19	0	30	41	54	56	58	54	51	54	78	71
Mercury	mg/kg	1120	33		<0.17	19	0	19	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Nickel	mg/kg	980		17	4	19	19	0	10	7	9	8	10	8	10	11	10	11
Selenium	mg/kg	12000		3	<1	19	2	17	<1	<1	<1	<1	<1	3	<1	<1	<1	<1
Zinc	mg/kg	740000		636	91	19	19	0	242	209	226	199	256	219	227	266	416	343
Asbestos																		
Asbestos in soil		Detect				19	2	17	NAD	NAD	NAD	NAD	NAD	NAD	NAD	Chrysotile	NAD	NAD
Asbestos Matrix (microscope)		Detect				19	2	17	-	-	-	-	-	-	-	Loose Fibres	-	-
Petroleum Hydrocarbons																		
Ali >C5-C6	mg/kg	5900	558		<0.01	4	0	4					<0.01					<0.01
Ali >C6-C8	mg/kg	17400	322		<0.01	4	0	4					<0.01					<0.01
Ali >C8-C10	mg/kg	4800	190		<1	4	0	4					<1					<1
Ali >C10-C12	mg/kg	22900	118		<1	4	0	4					<1					<1
Ali >C12-C16	mg/kg	82000	59		<1	4	0	4					<1					<1
Ali >C16-C21	mg/kg				<1	4	0	4					<1					<1
Ali >C21-C35	mg/kg			13	4	4	4	0					11					4
Ali >C16-C35 calculated	mg/kg	1000000		13	4	4	4	0					11					4
Total Aliphatics	mg/kg			13	4	4	4	0					11					4
Aro >C5-C7	mg/kg				<0.01	4	0	4					<0.01					<0.01
Aro >C7-C8	mg/kg				<0.01	4	0	4					<0.01					<0.01
Aro >C8-C10	mg/kg	8100	1503		<1	4	0	4					<1					<1
Aro >C10-C12	mg/kg	28000	899		<1	4	0	4					<1					<1
Aro >C12-C16	mg/kg	37000			<1	4	0	4					<1					<1
Aro >C16-C21	mg/kg	28000		5	<1	4	3	1					4					2
Aro >C21-C35	mg/kg	28000		15	3	4	4	0					15					9
Total Aromatics	mg/kg			19	3	4	4	0					19					11
TPH (Ali & Aro)	mg/kg			33	7	4	4	0					30					14
BTEX - Benzene	mg/kg	50			<0.01	4	0	4					<0.01					<0.01
BTEX - Toluene	mg/kg	107000	1916		<0.01	4	0	4					<0.01					<0.01
BTEX - Ethyl Benzene	mg/kg	13000	1216		<0.01	4	0	4					<0.01					<0.01
BTEX - o Xylene	mg/kg	15000	1120		<0.01	4	0	4					<0.01					<0.01
BTEX - m & p Xylene	mg/kg	13600	1353		<0.01	4	0	4					<0.01					<0.01
MTBE	mg/kg	12100			<0.01	4	0	4					<0.01					<0.01
TPH total (>C6-C40)	mg/kg			233	14	5	5	0	233						71			33
TPH ID (for FID characterisations)						5			Profile indicative of PAHs and other heavier unresolved hydrocarbons						Profile indicative of PAHs and other heavie			Profile indicat
Polycyclic aromatic hydrocarbons																		

Project name	Hallenbeagle
Project code	315111
Client name	Suez Recycling and Recovery Ltd UK
Address	Land at Hallenbeagle, Scorrier, Redruth Cornwall TR16 5BN
NGR	172714, 044783
Land use	Commercial Scenario
SOM	2.5%
GAC version	2019_00

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	Lab sample ID	Client sample ID	Depth to top	Depth to bottom	Date sampled
									22/06752/3	TP03	0.5		04/07/22
									22/06752/11	TP04	0.5		06/07/22
									22/06752/5	TP05	0.5		05/07/22
									22/06752/4	TP06	0.5		04/07/22
									22/06752/6	TP07	0.5		05/07/22
									22/06752/9	TP10	0.5		05/07/22
									22/06752/12	TP13	0.5		06/07/22
									22/06752/10	TP14	0.5		05/07/22
									22/06752/22	TP015	0.5		05/07/22
Metals and Inorganics													
Arsenic	mg/kg	640		11400	129	19	19	0	1350	1050	129	274	449	290	249	11400	235
Cadmium	mg/kg	410		2.5	<0.5	19	18	1	1.4	2.5	0.6	1	1.4	1.1	0.9	<0.5	0.9
Chromium	mg/kg	8600	49	22	11	19	19	0	15	22	11	17	20	18	15	13	15
Chromium (hexavalent)	mg/kg	49			<1	19	0	19	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	mg/kg	68000		748	71	19	19	0	748	559	71	129	244	134	160	228	136
Lead	mg/kg	2300		78	12	19	19	0	65	76	12	30	55	36	42	40	33
Mercury	mg/kg	1120	33		<0.17	19	0	19	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Nickel	mg/kg	980		17	4	19	19	0	10	13	4	7	10	8	7	17	6
Selenium	mg/kg	12000		3	<1	19	2	17	<1	<1	<1	<1	<1	<1	<1	1	<1
Zinc	mg/kg	740000		636	91	19	19	0	334	636	91	177	236	218	172	205	150
Asbestos																	
Asbestos in soil		Detect				19	2	17	NAD	Chrysotile	NAD	NAD	NAD	NAD	NAD	NAD	NAD
Asbestos Matrix (microscope)		Detect				19	2	17	-	Loose Fibres	-	-	-	-	-	-	-
Petroleum Hydrocarbons																	
Ali >C5-C6	mg/kg	5900	558		<0.01	4	0	4							<0.01		<0.01
Ali >C6-C8	mg/kg	17400	322		<0.01	4	0	4							<0.01		<0.01
Ali >C8-C10	mg/kg	4800	190		<1	4	0	4							<1		<1
Ali >C10-C12	mg/kg	22900	118		<1	4	0	4							<1		<1
Ali >C12-C16	mg/kg	82000	59		<1	4	0	4							<1		<1
Ali >C16-C21	mg/kg				<1	4	0	4							<1		<1
Ali >C21-C35	mg/kg			13	4	4	4	0							13		4
Ali >C16-C35 calculated	mg/kg	1000000		13	4	4	4	0							13		4
Total Aliphatics	mg/kg			13	4	4	4	0							13		4
Aro >C5-C7	mg/kg				<0.01	4	0	4							<0.01		<0.01
Aro >C7-C8	mg/kg				<0.01	4	0	4							<0.01		<0.01
Aro >C8-C10	mg/kg	8100	1503		<1	4	0	4							<1		<1
Aro >C10-C12	mg/kg	28000	899		<1	4	0	4							<1		<1
Aro >C12-C16	mg/kg	37000			<1	4	0	4							<1		<1
Aro >C16-C21	mg/kg	28000		5	<1	4	3	1							5		<1
Aro >C21-C35	mg/kg	28000		15	3	4	4	0							14		3
Total Aromatics	mg/kg			19	3	4	4	0							19		3
TPH (Ali & Aro)	mg/kg			33	7	4	4	0							33		7
BTEX - Benzene	mg/kg	50			<0.01	4	0	4							<0.01		<0.01
BTEX - Toluene	mg/kg	107000	1916		<0.01	4	0	4							<0.01		<0.01
BTEX - Ethyl Benzene	mg/kg	13000	1216		<0.01	4	0	4							<0.01		<0.01
BTEX - o Xylene	mg/kg	15000	1120		<0.01	4	0	4							<0.01		<0.01
BTEX - m & p Xylene	mg/kg	13600	1353		<0.01	4	0	4							<0.01		<0.01
MTBE	mg/kg	12100			<0.01	4	0	4							<0.01		<0.01
TPH total (>C6-C40)	mg/kg			233	14	5	5	0					63				14
TPH ID (for FID characterisations)						5			ive of humic substances				Profile indicative of humic substances				Concentration too low to id
Polycyclic aromatic hydrocarbons																	

Project name	Hallenbeagle
Project code	315111
Client name	Suez Recycling and Recovery Ltd UK
Address	Land at Hallenbeagle, Scorrier, Redruth Cornwall TR16 5BN
NGR	172714, 044783
Land use	Commercial Scenario
SOM	2.5%
GAC version	2019_00

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	
Lab sample ID									
Client sample ID									
Depth to top									
Depth to bottom									
Date sampled									
Metals and Inorganics									
Arsenic	mg/kg	640		11400	129	19	19	0	
Cadmium	mg/kg	410		2.5	<0.5	19	18	1	
Chromium	mg/kg	8600	49	22	11	19	19	0	
Chromium (hexavalent)	mg/kg	49			<1	19	0	19	
Copper	mg/kg	68000		748	71	19	19	0	
Lead	mg/kg	2300		78	12	19	19	0	
Mercury	mg/kg	1120	33		<0.17	19	0	19	
Nickel	mg/kg	980		17	4	19	19	0	
Selenium	mg/kg	12000		3	<1	19	2	17	
Zinc	mg/kg	740000		636	91	19	19	0	
Asbestos									
Asbestos in soil		Detect				19	2	17	
Asbestos Matrix (microscope)		Detect				19	2	17	
Petroleum Hydrocarbons									
Ali >C5-C6	mg/kg	5900	558		<0.01	4	0	4	
Ali >C6-C8	mg/kg	17400	322		<0.01	4	0	4	
Ali >C8-C10	mg/kg	4800	190		<1	4	0	4	
Ali >C10-C12	mg/kg	22900	118		<1	4	0	4	
Ali >C12-C16	mg/kg	82000	59		<1	4	0	4	
Ali >C16-C21	mg/kg				<1	4	0	4	
Ali >C21-C35	mg/kg			13	4	4	4	0	
Ali >C16-C35 calculated	mg/kg	1000000		13	4	4	4	0	
Total Aliphatics	mg/kg			13	4	4	4	0	
Aro >C5-C7	mg/kg				<0.01	4	0	4	
Aro >C7-C8	mg/kg				<0.01	4	0	4	
Aro >C8-C10	mg/kg	8100	1503		<1	4	0	4	
Aro >C10-C12	mg/kg	28000	899		<1	4	0	4	
Aro >C12-C16	mg/kg	37000			<1	4	0	4	
Aro >C16-C21	mg/kg	28000		5	<1	4	3	1	
Aro >C21-C35	mg/kg	28000		15	3	4	4	0	
Total Aromatics	mg/kg			19	3	4	4	0	
TPH (Ali & Aro)	mg/kg			33	7	4	4	0	
BTEX - Benzene	mg/kg	50			<0.01	4	0	4	
BTEX - Toluene	mg/kg	107000	1916		<0.01	4	0	4	
BTEX - Ethyl Benzene	mg/kg	13000	1216		<0.01	4	0	4	
BTEX - o Xylene	mg/kg	15000	1120		<0.01	4	0	4	
BTEX - m & p Xylene	mg/kg	13600	1353		<0.01	4	0	4	
MTBE	mg/kg	12100			<0.01	4	0	4	
TPH total (>C6-C40)	mg/kg			233	14	5	5	0	
TPH ID (for FID characterisations)						5			entify
Polycyclic aromatic hydrocarbons									

								Lab sample ID	22/06752/13	22/06752/14	22/06752/16	22/06752/17	22/06752/18	22/06752/19	22/06752/20	22/06752/21	22/06752/1	22/06752/2
								Client sample ID	BH1	BH2	HP01	HP01	HP02	HP02	HP03	HP03	TP01b	TP02
								Depth to top	0.5	0.5	0.4	0.8	0.5	0.8	0.4	0.8	0.5	0.5
								Depth to bottom										
								Date sampled	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	06/07/22	04/07/22	04/07/22
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects										
Acenaphthene	mg/kg	110000		0.02	<0.01	19	4	15	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01
Acenaphthylene	mg/kg	110000		0.07	<0.01	19	5	14	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.07	<0.01
Anthracene	mg/kg	540000		0.12	<0.02	19	8	11	0.12	<0.02	0.03	<0.02	0.02	<0.02	<0.02	0.03	0.1	0.03
Benzo(a)anthracene	mg/kg	170		0.86	<0.04	19	16	3	0.86	<0.04	0.12	<0.04	0.11	0.05	0.11	0.12	0.86	0.12
Benzo(a)pyrene	mg/kg	77		1.2	<0.04	19	16	3	1.13	<0.04	0.12	<0.04	0.11	0.06	0.12	0.12	1.2	0.11
Benzo(b)fluoranthene	mg/kg	45		1.46	<0.05	19	18	1	1.35	0.06	0.17	0.06	0.15	0.08	0.15	0.16	1.46	0.14
Benzo(ghi)perylene	mg/kg	3900		0.72	<0.05	19	11	8	0.69	<0.05	0.08	<0.05	0.05	<0.05	0.08	0.1	0.72	0.05
Benzo(k)fluoranthene	mg/kg	1200		0.54	<0.07	19	3	16	0.47	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.54	<0.07
Chrysene	mg/kg	350		0.89	<0.06	19	14	5	0.86	<0.06	0.14	<0.06	0.12	0.07	0.12	0.15	0.89	0.14
Dibenzo(ah)anthracene	mg/kg	3.6		0.15	<0.04	19	3	16	0.12	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.15	<0.04
Fluoranthene	mg/kg	23000		1.51	<0.08	19	17	2	1.51	<0.08	0.26	0.1	0.25	0.12	0.23	0.27	1.39	0.29
Fluorene	mg/kg	68000		0.04	<0.01	19	4	15	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01
Indeno(123-cd)pyrene	mg/kg	510		0.88	<0.03	19	16	3	0.86	<0.03	0.09	<0.03	0.07	0.04	0.09	0.1	0.88	0.07
Naphthalene	mg/kg	3900	183		<0.03	19	0	19	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Phenanthrene	mg/kg	22000		0.46	<0.03	19	17	2	0.31	0.04	0.1	0.03	0.15	0.05	0.08	0.11	0.33	0.17
Pyrene	mg/kg	54000		1.44	<0.07	19	17	2	1.44	<0.07	0.21	0.08	0.19	0.1	0.19	0.23	1.34	0.24
Total PAH-16MS	mg/kg			9.97	<0.08	19	18	1	9.81	0.1	1.32	0.27	1.22	0.57	1.17	1.42	9.97	1.36
Other analytes																		
% Stones >10mm	% w/w			46.4	<0.1	19	17	2	31	21.5	9.7	12.4	8.4	15.7	26.8	<0.1	15.8	23.8
Total Organic Carbon	% w/w			2.67	0.11	19	19	0	0.86	1.88	2.53	2.44	2.67	2.27	1.48	1.98	1.02	1.13
Converted to SOM (x / 0.58)	% w/w			4.603448	0.189655	19	19	0	1.48275862	3.24137931	4.36206897	4.20689655	4.60344828	3.9137931	2.55172414	3.4137931	1.75862069	1.94827586

								Lab sample ID	22/06752/3	22/06752/11	22/06752/5	22/06752/4	22/06752/6	22/06752/9	22/06752/12	22/06752/10	22/06752/22	
								Client sample ID	TP03	TP04	TP05	TP06	TP07	TP10	TP13	TP14	TP015	
								Depth to top	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
								Depth to bottom										
								Date sampled	04/07/22	06/07/22	05/07/22	04/07/22	05/07/22	05/07/22	06/07/22	05/07/22	05/07/22	
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete										
Acenaphthene	mg/kg	110000		0.02	<0.01	19	4	15	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	
Acenaphthylene	mg/kg	110000		0.07	<0.01	19	5	14	<0.01	0.02	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	
Anthracene	mg/kg	540000		0.12	<0.02	19	8	11	<0.02	0.06	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	<0.02	
Benzo(a)anthracene	mg/kg	170		0.86	<0.04	19	16	3	0.1	0.43	<0.04	0.13	0.06	0.04	0.12	0.06	0.04	
Benzo(a)pyrene	mg/kg	77		1.2	<0.04	19	16	3	0.13	0.55	<0.04	0.12	0.07	0.06	0.12	0.07	0.04	
Benzo(b)fluoranthene	mg/kg	45		1.46	<0.05	19	18	1	0.16	0.68	<0.05	0.15	0.1	0.08	0.16	0.1	0.06	
Benzo(ghi)perylene	mg/kg	3900		0.72	<0.05	19	11	8	0.09	0.29	<0.05	0.07	<0.05	<0.05	0.06	<0.05	<0.05	
Benzo(k)fluoranthene	mg/kg	1200		0.54	<0.07	19	3	16	<0.07	0.25	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	
Chrysene	mg/kg	350		0.89	<0.06	19	14	5	0.12	0.46	<0.06	0.13	0.07	<0.06	0.13	0.08	<0.06	
Dibenzo(ah)anthracene	mg/kg	3.6		0.15	<0.04	19	3	16	<0.04	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Fluoranthene	mg/kg	23000		1.51	<0.08	19	17	2	0.19	0.73	<0.08	0.39	0.13	0.11	0.24	0.13	0.09	
Fluorene	mg/kg	68000		0.04	<0.01	19	4	15	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	
Indeno(123-cd)pyrene	mg/kg	510		0.88	<0.03	19	16	3	0.1	0.37	<0.03	0.09	0.05	0.03	0.07	0.06	0.03	
Naphthalene	mg/kg	3900	183		<0.03	19	0	19	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Phenanthrene	mg/kg	22000		0.46	<0.03	19	17	2	0.06	0.21	<0.03	0.46	<0.03	0.04	0.07	0.06	0.03	
Pyrene	mg/kg	54000		1.44	<0.07	19	17	2	0.17	0.67	<0.07	0.32	0.11	0.1	0.21	0.12	0.07	
Total PAH-16MS	mg/kg			9.97	<0.08	19	18	1	1.12	4.77	<0.08	2.07	0.59	0.46	1.18	0.68	0.36	
Other analytes																		
% Stones >10mm	% w/w			46.4	<0.1	19	17	2	46.4	<0.1	37.3	19.9	8	4.4	23.9	43.1	28.8	
Total Organic Carbon	% w/w			2.67	0.11	19	19	0	0.5	1.97	0.11	0.62	1.9	1.32	2.28	0.84	1.19	
Converted to SOM (x / 0.58)	% w/w			4.603448	0.189655	19	19	0	0.86206897	3.39655172	0.18965517	1.06896552	3.27586207	2.27586207	3.93103448	1.44827586	2.05172414	

								Lab sample ID	
								Client sample ID	
								Depth to top	
								Depth to bottom	
								Date sampled	
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	
Acenaphthene	mg/kg	110000		0.02	<0.01	19	4	15	
Acenaphthylene	mg/kg	110000		0.07	<0.01	19	5	14	
Anthracene	mg/kg	540000		0.12	<0.02	19	8	11	
Benzo(a)anthracene	mg/kg	170		0.86	<0.04	19	16	3	
Benzo(a)pyrene	mg/kg	77		1.2	<0.04	19	16	3	
Benzo(b)fluoranthene	mg/kg	45		1.46	<0.05	19	18	1	
Benzo(ghi)perylene	mg/kg	3900		0.72	<0.05	19	11	8	
Benzo(k)fluoranthene	mg/kg	1200		0.54	<0.07	19	3	16	
Chrysene	mg/kg	350		0.89	<0.06	19	14	5	
Dibenzo(ah)anthracene	mg/kg	3.6		0.15	<0.04	19	3	16	
Fluoranthene	mg/kg	23000		1.51	<0.08	19	17	2	
Fluorene	mg/kg	68000		0.04	<0.01	19	4	15	
Indeno(123-cd)pyrene	mg/kg	510		0.88	<0.03	19	16	3	
Naphthalene	mg/kg	3900	183		<0.03	19	0	19	
Phenanthrene	mg/kg	22000		0.46	<0.03	19	17	2	
Pyrene	mg/kg	54000		1.44	<0.07	19	17	2	
Total PAH-16MS	mg/kg			9.97	<0.08	19	18	1	
Other analytes									
% Stones >10mm	% w/w			46.4	<0.1	19	17	2	
Total Organic Carbon	% w/w			2.67	0.11	19	19	0	
Converted to SOM (x / 0.58)	% w/w			4.603448	0.189655	19	19	0	

Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects	# exceeding GAC	# exceeding T1	Max sample (ID and depth)
Metals and Inorganics											
Arsenic	mg/kg	640		11400	129	19	19	0	6		TP14 - 0.5
Asbestos											
Asbestos in soil		Detect				19	2	17	2		
Asbestos Matrix (micr		Detect				19	2	17	2		

APPENDIX L
INFILTRATION TESTING

FULL SCALE SOAKAWAY TEST

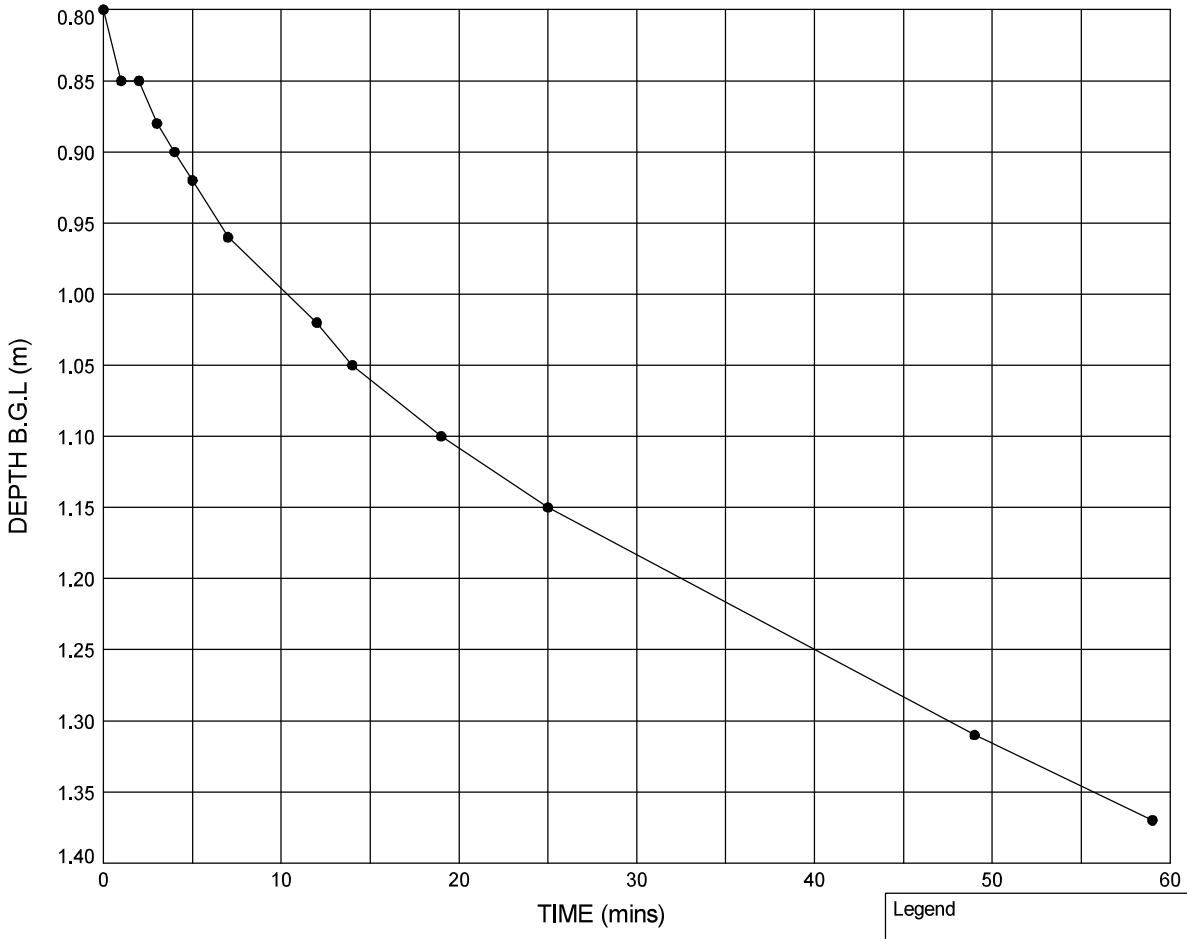
Non-standard test

Soakaway Test - Position ID : **TP01B**

Ground Level: **---**

National Grid Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



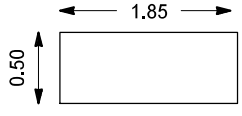
Test 1

Pit start depth:	=	*2.00*	m
Pit final depth:	=	*2.00*	m
Effective depth, De	=	*0.40*	m
Effective storage volume, V_{p75-25}	=	*0.1850*	m^3
Surface area, a_{s50}	=	*1.8650*	m^2
Time, t_{p75-25}	=	*900*	secs
Infiltration rate, f	=	$1.10x10^{-5}$	m/s

Legend

● Test 1 (04.07.22)

Plan (Not to scale)



No Bearing Taken

RSK GEOSCIENCES

Compiled By	Date	Checked By	Date
	24/08/22		**19/08/22**

Contract: **Hallenbeagle**

Contract Ref: **315111**

FULL SCALE SOAKAWAY TEST

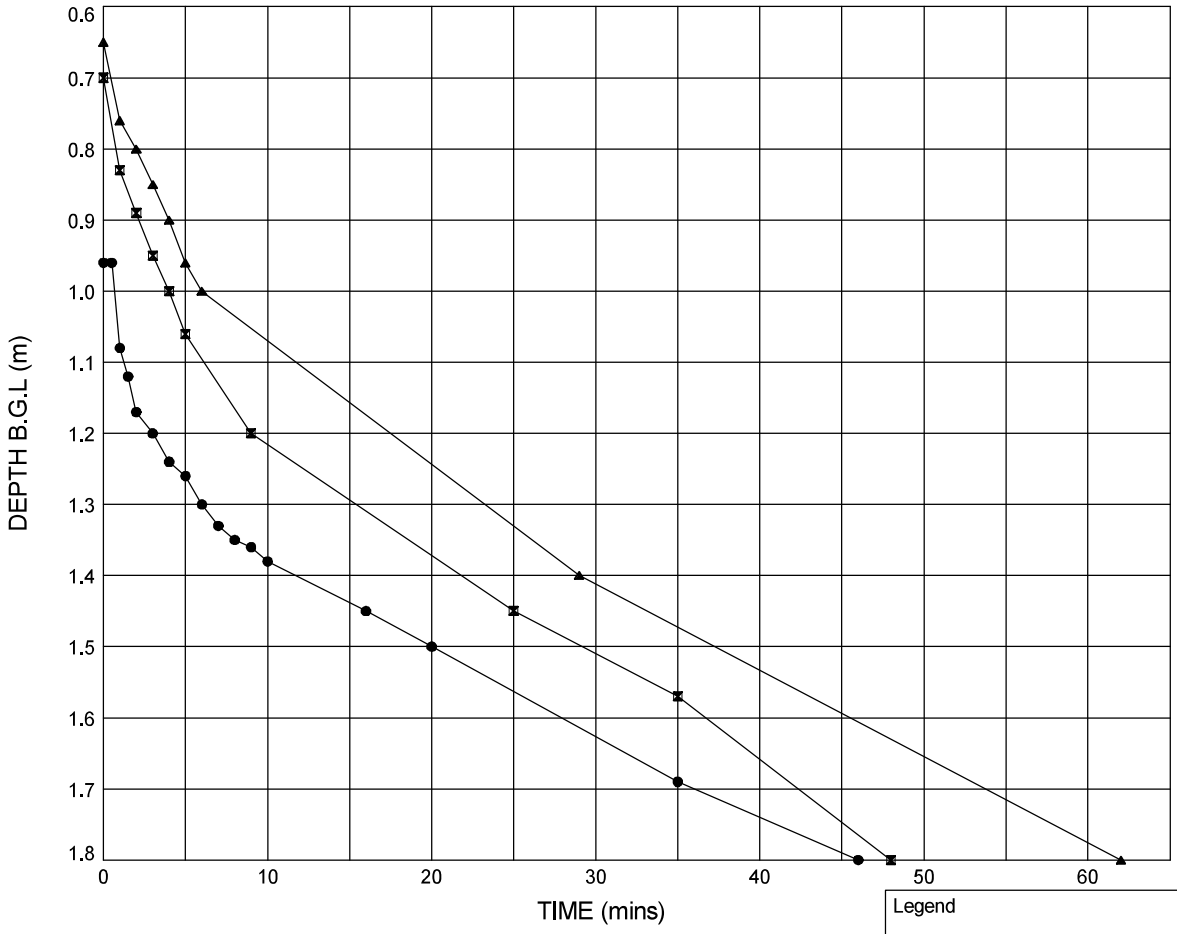
In accordance with BRE Digest 365

Soakaway Test - Position ID : **TP02**

Ground Level: **---**

National Grid Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME

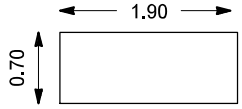


		Test 1	Test 2	Test 3	
Pit start depth:	=	*2.00*	*1.90*	*1.85*	m
Pit final depth:	=	*2.00*	*1.90*	*1.85*	m
Effective depth, De	=	*1.04*	*1.20*	*1.20*	m
Effective storage volume, V_{p75-25}	=	*0.6916*	*0.7980*	*0.7980*	m^3
Surface area, a_{s50}	=	*4.0340*	*4.4500*	*4.4500*	m^2
Time, t_{p75-25}	=	*2190*	*1962*	*2193*	secs
Infiltration rate, f	=	$7.83x10^{-5}$	$9.14x10^{-5}$	$8.18x10^{-5}$	m/s

Legend

- Test 1 (04.07.22)
- Test 2 (04.07.22)
- Test 3 (04.07.22)

Plan (Not to scale)



No Bearing Taken

RSK GEOSCIENCES

Compiled By	Date	Checked By	Date
	24/08/22		**19/08/22**

Contract: **Hallenbeagle**

Contract Ref: **315111**

FULL SCALE SOAKAWAY TEST

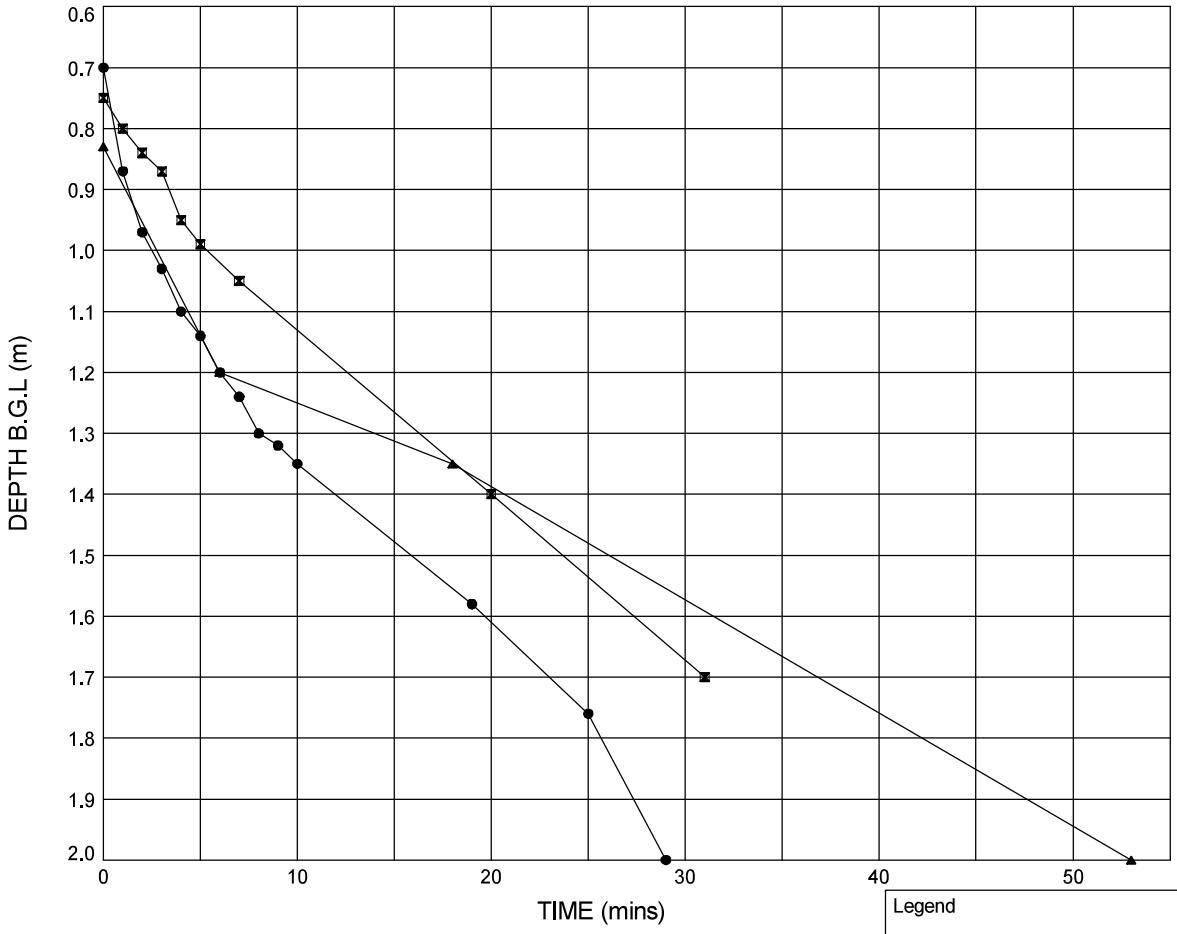
In accordance with BRE Digest 365

Soakaway Test - Position ID : **TP03**

Ground Level: **---**

National Grid Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME

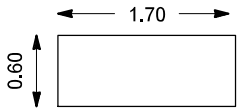


		Test 1	Test 2	Test 3	
Pit start depth:	=	*2.00*	*2.00*	*2.00*	m
Pit final depth:	=	*2.00*	*2.00*	*2.00*	m
Effective depth, De	=	*1.30*	*1.25*	*1.17*	m
Effective storage volume, V_{p75-25}	=	*0.6630*	*0.6375*	*0.5967*	m^3
Surface area, a_{s50}	=	*4.0100*	*3.8950*	*3.7110*	m^2
Time, t_{p75-25}	=	*1155*	*1384*	*1950*	secs
Infiltration rate, f	=	$1.43x10^{-4}$	$1.18x10^{-4}$	$8.25x10^{-5}$	m/s

Legend

- Test 1 (04.07.22)
- Test 2 (04.07.22)
- Test 3 (04.07.22)

Plan (Not to scale)



No Bearing Taken

RSK GEOSCIENCES

Compiled By	Date	Checked By	Date
	24/08/22		**19/08/22**

Contract: **Hallenbeagle**

Contract Ref: **315111**

FULL SCALE SOAKAWAY TEST

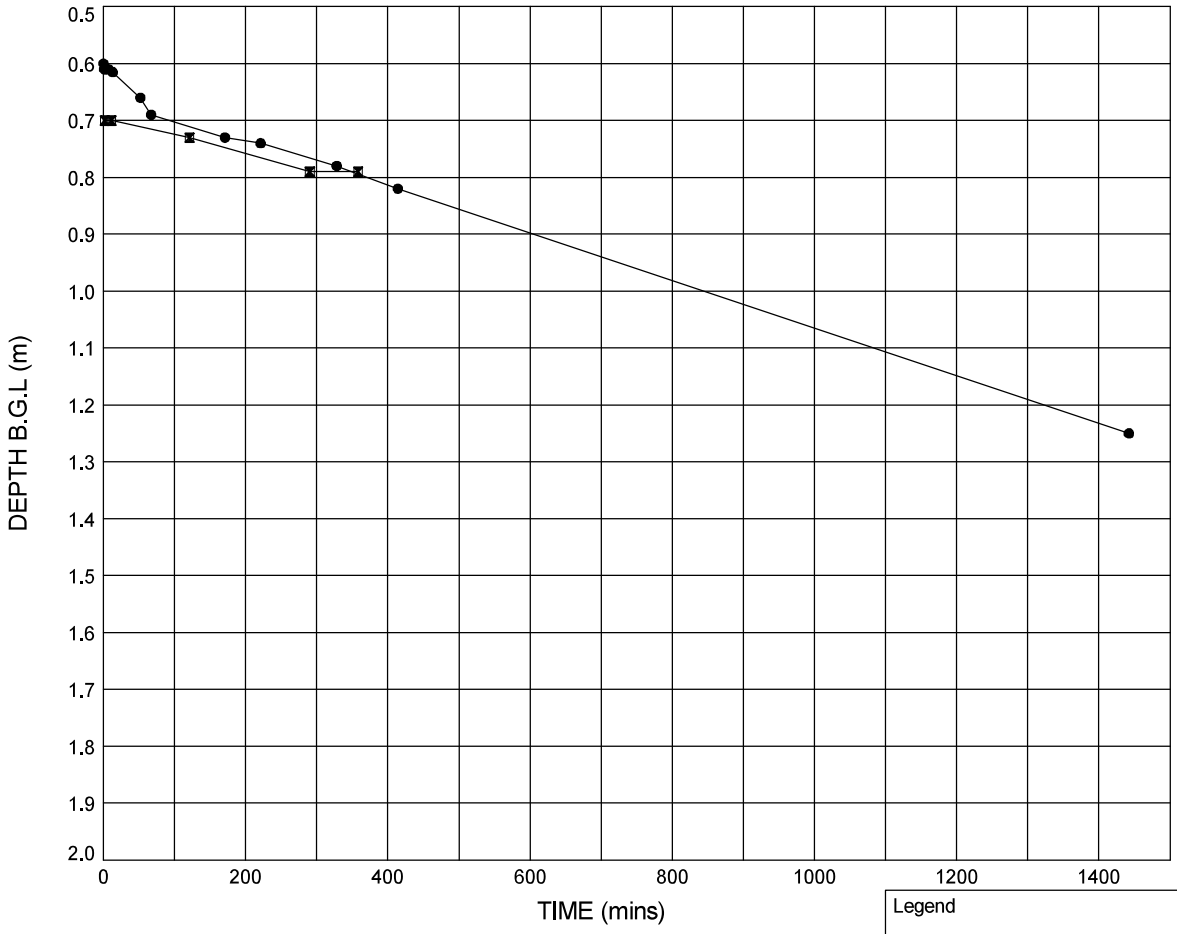
In accordance with BRE Digest 365

Soakaway Test - Position ID : **TP14**

Ground Level: ---

National Grid Co-ordinates: ---

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



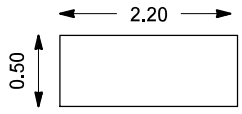
		Test 1	Test 2	
Pit start depth:	=	*2.00*	*2.00*	m
Pit final depth:	=	*2.00*	*2.00*	m
Effective depth, De	=	*1.40*	*1.30*	m
Effective storage volume, V_{p75-25}	=	*0.7000*	*0.7150*	m^3
Surface area, a_{s50}	=	*4.8800*	*4.6100*	m^2
Time, t_{p75-25}	=	*100410*	*N/A*	secs
Infiltration rate, f	=	*$1.57x10^{-6}$*	*N/A*	m/s

Please note test data was extrapolated to obtain tp75-tp25. Notes: Test 2 - Test 2: Insufficient drop in water level to calculate infiltration coefficient.

Legend

- Test 1 (05.07.22)
- Test 2 (06.07.22)

Plan (Not to scale)



No Bearing Taken

RSK GEOSCIENCES

Compiled By	Date	Checked By	Date
	24/08/22		**19/08/22**

Contract: **Hallenbeagle**

Contract Ref: **315111**

FULL SCALE SOAKAWAY TEST

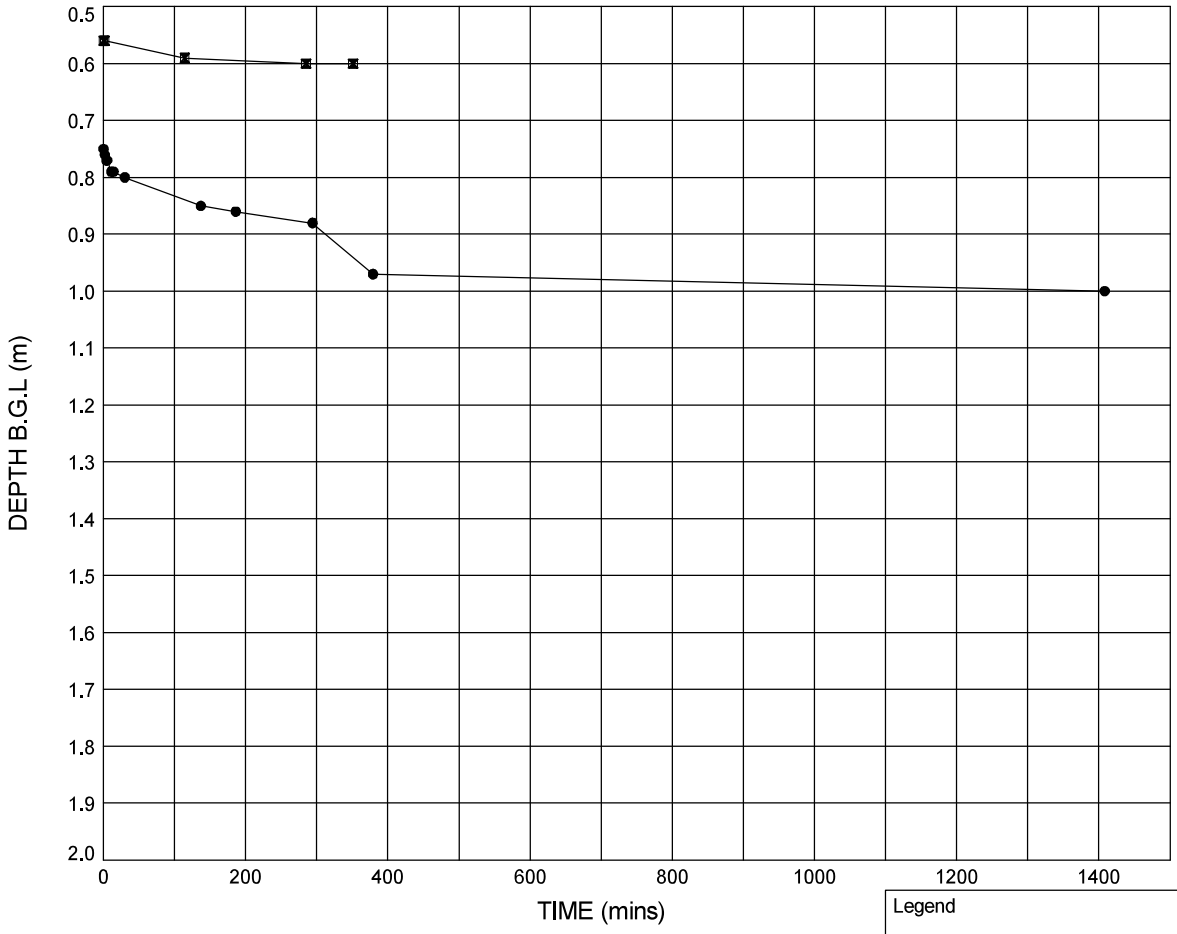
In accordance with BRE Digest 365

Soakaway Test - Position ID : **TP15**

Ground Level: ---

National Grid Co-ordinates: ---

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



		Test 1	Test 2	
Pit start depth:	=	*2.00*	*2.00*	m
Pit final depth:	=	*2.00*	*2.00*	m
Effective depth, De	=	*1.15*	*1.44*	m
Effective storage volume, V_{p75-25}	=	*0.6875*	*0.7920*	m^3
Surface area, a_{s50}	=	*4.4750*	*4.9880*	m^2
Time, t_{p75-25}	=	*1471373*	*N/A*	secs
Infiltration rate, f	=	*$1.04x10^{-7}$*	*N/A*	m/s

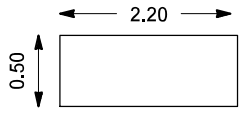
Please note test data was extrapolated to obtain tp75-tp25. Notes: Test 2 - Test 2: Insufficient drop in water level to calculate infiltration coefficient.

Legend

● Test 1 (05.07.22)

⧓ Test 2 (06.07.22)

Plan (Not to scale)



No Bearing Taken

RSK GEOSCIENCES

Compiled By	Date	Checked By	Date
	24/08/22		**19/08/22**

Contract: **Hallenbeagle**

Contract Ref: **315111**

APPENDIX M
GQRA SCREENING TABLE GAS

Calculations of borehole hazardous gas flow rate in accordance with BS8485

Project No.:	315111
Client:	SUEZ Recycling and Recovery UK Ltd
Site:	Hallenbeagle

In accordance with BS8485 Section 6.3.1 the data presented below are calculations of borehole hazardous gas flow rates (Q_{hg}).

The Q_{hg} can then be used, along with a robust conceptual site model and review of the data collected, to designate a site characteristic (or zone) gas screening value (GSV).

GSVs are used to characterise the potential risk and inform mitigation measures where appropriate.

The assessment below presents calculated Q_{hg} values and compares them directly to Characteristic Situations as presented in BS8485 Table 2.

The ultimate site characteristic GSV (for the site or for individual zones) to inform risk assessment and mitigation measures is detailed in the body of the report, and may be different to the individual calculations below.

The calculations below use peak concentrations and steady state flow to calculate the Q_{hg}.

Characteristic Situation	Hazard potential	GSV
1	Very Low	<0.07
2	Low	<0.7
3	Moderate	<3.5
4	Moderate to High	<15
5	High	<70
6	Very High	>=70

British Standard Institution (BSI) (2019), 'BS 8485:2015+A1:2019. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

KEY	
Qhg	Borehole hazardous gas flow rate (steady state flow * (peak concentration / 100))
GSV	Gas Screening Value
	GSV / Q_{hg} indicates very low hazard potential
	GSV / Q_{hg} indicates low to moderate hazard potential
	GSV / Q_{hg} indicates moderate or greater hazard potential
	Data exceeds either 1% CH_4, 5% CO_2 or 70 L/hr flow (see BS8485 Table 2)

SUMMARY OF Qhg VALUES PER BOREHOLE, PER MONITORING ROUND

BH NO.	DATE	CH_4 peak %v/v	CH_4 SS %v/v	CO_2 peak %v/v	CO_2 SS %v/v	O_2 min %v/v	Flow SS l/hr	Baro mbar	Q_{hg} CH_4	Q_{hg} CO_2	CS No.
BH1	02/08/2022	0	0	6.1	6.1	16.2	0	1004	0.00	0.00	CS1
BH2	02/08/2022	0	0	4.2	4.1	17.6	0	1004	0.00	0.00	CS1

WORST-CASE Qhg VALUES PER BOREHOLE

		Maximum CH_4		Maximum CO_2				Baro	Maximum Q_{hg}		
BH NO.	DATE	CH_4 peak %v/v	CH_4 SS %v/v	CO_2 peak %v/v	CO_2 SS %v/v	Min O_2	Max SS Flow	mbar	CH_4	CO_2	CS No.
BH1	02/08/2022	0	0	6.1	6.1	16.2	0		0.00	0.00	CS1
BH2	02/08/2022	0	0	4.2	4.1	17.6	0		0.00	0.00	CS1

WORST-CASE Qhg CHECK FOR SITE (BS8485 Section 6.3.7.4)

		Maximum CH_4		Maximum CO_2				Baro	Maximum Q_{hg}		
BH NO.	DATE	CH_4 peak %v/v	CH_4 SS %v/v	CO_2 peak %v/v	CO_2 SS %v/v	Min O_2	Max SS Flow	mbar	CH_4	CO_2	CS No
ALL	02/08/2022	0	0	6.1	6.1	16.2	0		0.00	0.00	CS1

APPENDIX N
WM3

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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

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If any calculation cells below state "0.00000", testing has NOT been undertaken that co

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315111 Hallenbeagle

TP/WS/BH		TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
Depth (m)		0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																
% Moisture	%															
pH (soil)																7.30
pH (leachate)																7.80
Arsenic	mg/kg	1,190	555	1,350	274	129	449	39	290	11,400	1,050	249	466	973	48	541
Cadmium	mg/kg	1.8	1.5	1.4	1.0	0.6	1.4	1.1	1.1	<0.5	2.5	0.9	1.2	1.3	<0.5	1.1
Copper	mg/kg	380	328	748	129	71	244	24	134	228	559	160	177	466	32	231
CrVI or Chromium	mg/kg	20	18	15	17	11	20	19	18	13	22	15	14	16	7	17
Lead	mg/kg	78	71	65	30	12	55	23	36	40	76	42	30	41	15	54
Mercury	mg/kg	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Nickel	mg/kg	10	11	10	7	4	10	7	8	17	13	7	10	7	2	9
Selenium	mg/kg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Zinc	mg/kg	416	343	334	177	91	236	254	218	205	636	172	242	209	21	226
Barium	mg/kg															
Beryllium	mg/kg															
Vanadium	mg/kg															
Cobalt	mg/kg															
Manganese	mg/kg															
Molybdenum	mg/kg															
Antimony	mg/kg															
Aluminium	mg/kg															
Bismuth	mg/kg															
CrIII	mg/kg															
Iron	mg/kg															
Strontium	mg/kg															
Tellurium	mg/kg															
Thallium	mg/kg															
Titanium	mg/kg															
Tungsten	mg/kg															
Ammoniacal N	mg/kg															
ws Boron	mg/kg															
PAH (Input Total PAH **OR** individual PAH results)																
Acenaphthene	mg/kg	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Acenaphthylene	mg/kg	0.07	<0.01	<0.01	0.04	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.05	0.01	0.01	0.01
Anthracene	mg/kg	0.10	0.03	<0.02	0.11	0.02	0.02	0.02	0.02	0.02	0.06	0.02	0.12	0.02	0.02	0.02
Benzo(a)anthracene	mg/kg	0.86	0.12	0.10	0.13	0.04	0.06	0.04	0.04	0.06	0.43	0.12	0.86	0.04	0.04	0.12
Benzo(a)pyrene	mg/kg	1.20	0.11	0.13	0.12	0.04	0.07	0.04	0.06	0.07	0.55	0.12	1.13	0.04	<0.04	0.12
Benzo(b)fluoranthene	mg/kg	1.46	0.14	0.16	0.15	0.05	0.10	0.05	0.08	0.10	0.68	0.16	1.35	0.06	<0.05	0.17
Benzo(ghi)perylene	mg/kg	0.72	0.05	0.09	0.07	0.05	0.05	0.05	0.05	0.05	0.29	0.06	0.69	0.05	0.05	0.08
Benzo(k)fluoranthene	mg/kg	0.54	<0.07	<0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.25	<0.07	0.47	0.07	0.07	0.07
Chrysene	mg/kg	0.89	0.14	0.12	0.13	0.06	0.07	0.06	0.06	0.08	0.46	0.13	0.86	0.06	0.06	0.14
Dibenzo(ah)anthracene	mg/kg	0.15	<0.04	<0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	<0.04	0.12	0.04	0.04	0.04
Fluoranthene	mg/kg	1.39	0.29	0.19	0.39	0.08	0.13	0.08	0.11	0.13	0.73	0.24	1.51	0.08	0.08	0.26
Fluorene	mg/kg	0.02	<0.01	<0.01	0.04	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.02	0.01	0.01	0.01
Indeno(123cd)pyrene	mg/kg	0.88	0.07	0.10	0.09	0.03	0.05	0.03	0.03	0.06	0.37	0.07	0.86	0.03	0.03	0.03
Naphthalene	mg/kg	<0.03	<0.03	<0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	<0.03	<0.03	0.03	0.03	0.03
Phenanthrene	mg/kg	0.33	0.17	0.06	0.46	0.03	0.03	0.03	0.04	0.06	0.21	0.07	0.31	0.04	0.03	0.10
Pyrene	mg/kg	1.34	0.24	0.17	0.32	0.07	0.11	0.07	0.10	0.12	0.67	0.21	1.44	0.07	0.07	0.21
Coronene	mg/kg															
Total PAHs (16 or 17)	mg/kg															
TPH																
Petrol	mg/kg															
Diesel	mg/kg															
Lube Oil	mg/kg															
Crude Oil	mg/kg															
White Spirit / Kerosene	mg/kg															
Creosote	mg/kg															
Unknown TPH with ID	mg/kg															
Unknown TPHCWG	mg/kg															

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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

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TP/WS/BH		TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
Depth (m)		0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																
Total Sulphide	mg/kg															
Complex Cyanide	mg/kg															
Free (or Total) Cyanide	mg/kg															
Thiocyanate	mg/kg															
Elemental/Free Sulphur	mg/kg															
Phenols Input Total Phenols HPLC **OR** individual Phenol results.																
Phenol	mg/kg															
Cresols	mg/kg															
Xylenols	mg/kg															
Resourcinol	mg/kg															
Phenols Total by HPLC	mg/kg															
BTEX Input Total BTEX **OR** individual BTEX results.																
Benzene	mg/kg		<0.01					<0.01				<0.01				
Toluene	mg/kg		<0.01					<0.01				<0.01				
Ethylbenzene	mg/kg		<0.01					<0.01				<0.01				
Xylenes	mg/kg		<0.01					<0.01				<0.01				
Total BTEX	mg/kg															
PCBs (POPs)																
PCBs Total (eg EC7/WHO12)	mg/kg															
PBBs (POPs)																
Hexabromobiphenyl (Total or PBB153; 2,2',4,4',5,5'- if only available)	mg/kg															

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If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

Please enter available data in the rows associated with the test (grey) cells. Calculation cells
If any calculation cells below state "0.00000", testing has NOT been undertaken that co

TP/WS/BH		TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
Depth (m)		0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																
POPs Dioxins and Furans Input Total Dioxins and Furans **OR** individual Dioxin and Furan results.																
2,3,7,8-TeCDD	mg/kg															
1,2,3,7,8-PeCDD	mg/kg															
1,2,3,4,7,8-HxCDD	mg/kg															
1,2,3,6,7,8-HxCDD	mg/kg															
1,2,3,7,8,9-HxCDD	mg/kg															
1,2,3,4,6,7,8-HpCDD	mg/kg															
OCDD	mg/kg															
2,3,7,8-TeCDF	mg/kg															
1,2,3,7,8-PeCDF	mg/kg															
2,3,4,7,8-PeCDF	mg/kg															
1,2,3,4,7,8-HxCDF	mg/kg															
1,2,3,6,7,8-HxCDF	mg/kg															
2,3,4,6,7,8-HxCDF	mg/kg															
1,2,3,7,8,9-HxCDF	mg/kg															
1,2,3,4,6,7,8-HpCDF	mg/kg															
1,2,3,4,7,8,9-HpCDF	mg/kg															
OCDF	mg/kg															
Total Dioxins and Furans	mg/kg															
Some Pesticides (POPs unless otherwise stated)																
Aldrin	mg/kg															
α Hexachlorocyclohexane (alpha-HCH) *(leave empty if total HCH results used)*	mg/kg															
β Hexachlorocyclohexane (beta-HCH) *(leave empty if total HCH results used)*	mg/kg															
α Cis-Chlordane (alpha) ***OR*** *Total Chlordane*	mg/kg															
δ Hexachlorocyclohexane (delta-HCH) *(leave empty if total HCH results used)*	mg/kg															
Dieldrin	mg/kg															
Endrin	mg/kg															
χ Hexachlorocyclohexane (gamma-HCH) (lindane) ***OR*** *Total HCH*	mg/kg															
Heptachlor	mg/kg															
Hexachlorobenzene	mg/kg															
o,p'-DDT *(leave empty if total DDT results used)*	mg/kg															
p,p'-DDT ***OR*** *Total DDT*	mg/kg															
χ Trans-Chlordane (gamma) *(leave empty if total Chlordane results used)*	mg/kg															
Chlordecone (kepone)	mg/kg															
Pentachlorobenzene	mg/kg															
Mirex	mg/kg															
Toxaphene (camphechlor)	mg/kg															
Tin																
Tin *(leave empty if Organotin and Tin excl Organotin results used)*	mg/kg															
Organotin																

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TP/WS/BH		TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
Depth (m)		0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																
Dibutyltin; DiBT	mg/kg															
Tributyltin; TriBT	mg/kg															
Triphenyltin; TriPT	mg/kg															
Tetrabutyltin; TeBT	mg/kg															
Tin excluding Organotin																
Tin excl Organotin	mg/kg															

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TP/WS/BH		TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
Depth (m)		0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																
Asbestos in Soil	Thresholds															
Asbestos detected in Soil (enter Y or N)	Y									Y						
		If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7												If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HI		
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Carc HP7 % Asbestos in Soil (Fibres)" below	%														
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces) *Please be advised, if the calculation cell is "0.00000" DOES NOT MEAN asbestos testing has been undertaken and the result is zero.*	≥0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00500	0.00000	0.00000	0.00000	0.00000	0.00000
		If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.									If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results when visual identifiable pieces are present.						
Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y															
		If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.									If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste H Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible wi					
		Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.									Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is n					
		All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.									All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil resu					
Hazardous Property	Thresholds	Cut Off Value	If cells below turn yellow and the text turns red, the samples should be classified as Hazardous Waste.													If cells below turn yellow and the text turns red, the samples should be classified as
Corrosive HP8	≥5%	<1%	0.16092	0.07672	0.18108	0.03943	0.01914	0.06311	0.00880	0.04174	1.50730	0.14282	0.03575	0.06420	0.13151	0.00768	0.07468
Irritant HP4	≥10%	<1%	0.20002	0.11032	0.26272	0.05075	0.02505	0.08684	0.00786	0.05342	1.53056	0.20177	0.05095	0.08151	0.18109	0.00995	0.09752
Irritant HP4	≥20%	<1%	0.04515	#VALUE!	#VALUE!	0.01609	0.00885	0.02961	#VALUE!	0.01678	0.02922	0.06589	#VALUE!	0.02222	0.05409	0.00403	0.02796
Specifc Target Organ Toxicity HP5	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥20%		0.00003	0.00002	0.00001	0.00005	0.00000	0.00000	0.00000	0.00000	0.00001	0.00002	0.00001	0.00003	0.00000	0.00000	0.00001
Specifc Target Organ Toxicity HP5	≥1%		0.00384	0.00346	0.00288	0.00326	0.00211	0.00384	0.00365	0.00346	0.00343	0.00422	0.00288	0.00269	0.00307	0.00134	0.00326
Specifc Target Organ Toxicity HP5	≥10%		0.00780	0.00710	0.00650	0.00300	0.00120	0.00550	0.00230	0.00360	0.00400	0.00760	0.00420	0.00300	0.00410	0.00150	0.00540
Aspiration Toxicity HP5	≥10%		0.00000	#VALUE!	0.00000	0.00000	0.00000	0.00000	#VALUE!	0.00000	0.00000	0.00000	#VALUE!	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	0.15710	0.07328	0.17822	0.03619	0.01705	0.05929	0.00517	0.03830	1.50482	0.13862	0.03289	0.06153	0.12845	0.00635	0.07143
Acute Toxicity HP6	≥5%	<0.1%	0.00398	0.00360	0.00302	0.00341	0.00225	0.00398	0.00379	0.00360	0.00264	0.00437	0.00302	0.00283	0.00321	0.00149	0.00341
Acute Toxicity HP6	≥25%	<1%	#VALUE!	#VALUE!	#VALUE!	0.01918	0.01011	0.03525	0.00655	0.02049	#VALUE!	0.07374	#VALUE!	#VALUE!	0.05832	#VALUE!	0.03347
Acute Toxicity HP6	≥0.25%	<0.1%	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Acute Toxicity HP6	≥2.5%	<0.1%	0.00384	0.00346	0.00288	0.00326	0.00211	0.00384	0.00365	0.00346	0.00250	0.00422	0.00288	0.00269	0.00307	0.00134	0.00326
Acute Toxicity HP6	≥15%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥55%	<1%	0.00018	#VALUE!	0.00014	0.00010	0.00006	0.00014	#VALUE!	0.00011	#VALUE!	0.00025	#VALUE!	0.00012	0.00013	#VALUE!	0.00011
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.5%	<0.1%	0.00404	0.00362	0.00304	0.00338	0.00219	0.00400	0.00378	0.00358	#VALUE!	0.00449	0.00299	0.00283	0.00322	#VALUE!	0.00339
Acute Toxicity HP6	≥3.5%	<0.1%	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014	0.00014
Acute Toxicity HP6	≥22.5%	<1%	0.05276	#VALUE!	0.09304	0.01899	0.01003	0.03509	#VALUE!	0.02036	0.03320	0.07339	#VALUE!	0.02502	0.05817	0.00552	0.03332
Carcinogenic HP7	≥0.1%		0.15708	0.07326	0.17820	0.03617	0.01703	0.05927	0.00515	0.03828	1.50480	0.13860	0.03287	0.06151	0.12844	0.00634	0.07141
Carcinogenic HP7	≥0.1%		0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
Carcinogenic HP7	≥1%		0.00009	0.00001	0.00001	0.00001	0.00000	0.00001	0.00000	0.00000	0.00001	0.00004	0.00001	0.00009	0.00000	0.00000	0.00000
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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			TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
TP/WS/BH																	
Depth (m)			0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																	
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.5		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.80
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.30
Toxic for Reproduction HP10	≥0.3%		0.00780	0.00710	0.00650	0.00300	0.00120	0.00550	0.00230	0.00360	0.00400	0.00760	0.00420	0.00300	0.00410	0.00150	0.00540
Toxic for Reproduction HP10	≥3%		0.00384	0.00346	0.00288	0.00326	0.00211	0.00384	0.00365	0.00346	0.00250	0.00422	0.00288	0.00269	0.00307	0.00134	0.00326
Mutagenic HP11	≥0.1%		0.00384	0.00346	0.00288	0.00326	0.00211	0.00384	0.00365	0.00346	0.00250	0.00422	0.00288	0.00269	0.00307	0.00134	0.00326
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Mutagenic HP11	≥1%		0.00202	0.00222	0.00202	0.00141	0.00081	0.00202	0.00141	0.00162	0.00343	0.00263	0.00141	0.00202	0.00141	0.00040	0.00182
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HP13 Sensitising	≥10%		0.00384	0.00346	0.00288	0.00326	0.00211	0.00384	0.00365	0.00346	0.00343	0.00422	0.00288	0.00269	0.00307	0.00134	0.00326
Ecotoxic HP14 amended v6	≥25%	<0.1%	#VALUE!	#VALUE!	#VALUE!	0.08101	0.04082	0.12808	0.04730	0.08968	#VALUE!	0.29657	#VALUE!	#VALUE!	0.21616	#VALUE!	0.13665
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	0.08101	0.04082	0.12808	#VALUE!	0.08968	#VALUE!	0.29657	#VALUE!	#VALUE!	0.21616	#VALUE!	0.13665

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TP/WS/BH			TP01b	TP02	TP03	TP06	TP05	TP07	TP08	TP10	TP14	TP04	TP13	BH1	BH2	TP12	HP01
Depth (m)			0.50	0.50	0.50	0.50	0.50	0.50	2.6	0.5	0.5	0.50	0.50	0.50	0.50	1.40	0.40
Envirolab reference																	
Ecotoxic HP14 amended v6	≥25%	<0,1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	8.10130	4.08240	12.80780	#VALUE!	8.96840	#VALUE!	29.65680	#VALUE!	#VALUE!	21.61550	#VALUE!	13.66530
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0,005%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0,0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0,0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

If other contaminants need adding to Haswaste, please contact Envirolab.

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315111 Hallenbeagle

TP/WS/BH		HP01	HP02	HP02	HP03	HP03	TP015									
Depth (m)		0.80	0.50	0.80	0.40	0.80	0.50									
Envirolab reference																
% Moisture	%															
pH (soil)		7.08	6.71	7.06	7.77	8.13										
pH (leachate)		7.60	7.40	7.40	7.60	7.70										
Arsenic	mg/kg	572	479	486	632	646	235									
Cadmium	mg/kg	1.1	1.3	1.2	1.0	1.6	0.9									
Copper	mg/kg	242	252	228	203	233	136									
CrVI or Chromium	mg/kg	16	20	17	16	19	15									
Lead	mg/kg	56	58	54	51	54	33									
Mercury	mg/kg	0.17	0.17	0.17	0.17	0.17	0.17									
Nickel	mg/kg	8	10	8	10	11	6									
Selenium	mg/kg	1	1	1	1	1	<1									
Zinc	mg/kg	199	256	219	227	266	150									
Barium	mg/kg															
Beryllium	mg/kg															
Vanadium	mg/kg															
Cobalt	mg/kg															
Manganese	mg/kg															
Molybdenum	mg/kg															
Antimony	mg/kg															
Aluminium	mg/kg															
Bismuth	mg/kg															
CrIII	mg/kg															
Iron	mg/kg															
Strontium	mg/kg															
Tellurium	mg/kg															
Thallium	mg/kg															
Titanium	mg/kg															
Tungsten	mg/kg															
Ammoniacal N	mg/kg															
ws Boron	mg/kg															
PAH (Input Total PAH **OR** individual PAH results)																
Acenaphthene	mg/kg	0.01	0.01	0.01	0.01	0.01	0.01									
Acenaphthylene	mg/kg	0.01	0.01	0.01	0.01	0.01	0.01									
Anthracene	mg/kg	0.02	0.02	0.02	0.02	0.03	0.02									
Benzo(a)anthracene	mg/kg	0.04	0.11	0.05	0.11	0.12	0.04									
Benzo(a)pyrene	mg/kg	0.04	0.11	0.06	0.12	0.12	0.04									
Benzo(b)fluoranthene	mg/kg	0.06	0.15	0.08	0.15	0.16	0.06									
Benzo(ghi)perylene	mg/kg	0.05	0.05	0.05	0.08	0.10	0.05									
Benzo(k)fluoranthene	mg/kg	0.07	0.07	0.07	0.07	0.07	0.07									
Chrysene	mg/kg	<0.06	0.12	0.07	0.12	0.15	0.06									
Dibenzo(ah)anthracene	mg/kg	0.04	0.04	0.04	0.04	0.04	0.04									
Fluoranthene	mg/kg	0.10	0.25	0.12	0.23	0.27	0.09									
Fluorene	mg/kg	0.01	0.01	0.01	0.01	0.01	0.01									
Indeno(123cd)pyrene	mg/kg	0.03	0.07	0.04	0.09	0.10	0.03									
Naphthalene	mg/kg	0.03	0.03	0.03	0.03	0.03	0.03									
Phenanthrene	mg/kg	0.03	0.15	0.05	0.08	0.11	0.03									
Pyrene	mg/kg	0.08	0.19	0.10	0.19	0.23	0.07									
Coronene	mg/kg															
Total PAHs (16 or 17)	mg/kg															
TPH																
Petrol	mg/kg															
Diesel	mg/kg															
Lube Oil	mg/kg															
Crude Oil	mg/kg															
White Spirit / Kerosene	mg/kg															
Creosote	mg/kg															
Unknown TPH with ID	mg/kg															
Unknown TPHCWG	mg/kg															

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315111 Hallenbeagle

TP/WS/BH		HP01	HP02	HP02	HP03	HP03	TP015									
Depth (m)		0.80	0.50	0.80	0.40	0.80	0.50									
Envirolab reference																
Total Sulphide	mg/kg															
Complex Cyanide	mg/kg															
Free (or Total) Cyanide	mg/kg															
Thiocyanate	mg/kg															
Elemental/Free Sulphur	mg/kg															
Phenols Input Total Phenols HPLC **OR** individual Phenol results.																
Phenol	mg/kg															
Cresols	mg/kg															
Xylenols	mg/kg															
Resourcinol	mg/kg															
Phenols Total by HPLC	mg/kg															
BTEX Input Total BTEX **OR** individual BTEX results.																
Benzene	mg/kg		<0.01				<0.01									
Toluene	mg/kg		<0.01				<0.01									
Ethylbenzene	mg/kg		<0.01				<0.01									
Xylenes	mg/kg		<0.01				<0.01									
Total BTEX	mg/kg															
PCBs (POPs)																
PCBs Total (eg EC7/WHO12)	mg/kg															
PBBs (POPs)																
Hexabromobiphenyl (Total or PBB153; 2,2',4,4',5,5'- if only available)	mg/kg															

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315111 Hallenbeagle

TP/WS/BH	HP01	HP02	HP02	HP03	HP03	TP015									
Depth (m)	0.80	0.50	0.80	0.40	0.80	0.50									
Envirolab reference															
POPs Dioxins and Furans Input Total Dioxins and Furans **OR** individual Dioxin and Furan results.															
2,3,7,8-TeCDD	mg/kg															
1,2,3,7,8-PeCDD	mg/kg															
1,2,3,4,7,8-HxCDD	mg/kg															
1,2,3,6,7,8-HxCDD	mg/kg															
1,2,3,7,8,9-HxCDD	mg/kg															
1,2,3,4,6,7,8-HpCDD	mg/kg															
OCDD	mg/kg															
2,3,7,8-TeCDF	mg/kg															
1,2,3,7,8-PeCDF	mg/kg															
2,3,4,7,8-PeCDF	mg/kg															
1,2,3,4,7,8-HxCDF	mg/kg															
1,2,3,6,7,8-HxCDF	mg/kg															
2,3,4,6,7,8-HxCDF	mg/kg															
1,2,3,7,8,9-HxCDF	mg/kg															
1,2,3,4,6,7,8-HpCDF	mg/kg															
1,2,3,4,7,8,9-HpCDF	mg/kg															
OCDF	mg/kg															
Total Dioxins and Furans	mg/kg															
Some Pesticides (POPs unless otherwise stated)															
Aldrin	mg/kg															
α Hexachlorocyclohexane (alpha-HCH) *(leave empty if total HCH results used)*	mg/kg															
β Hexachlorocyclohexane (beta-HCH) *(leave empty if total HCH results used)*	mg/kg															
α Cis-Chlordane (alpha) ***OR*** *Total Chlordane*	mg/kg															
δ Hexachlorocyclohexane (delta-HCH) *(leave empty if total HCH results used)*	mg/kg															
Dieldrin	mg/kg															
Endrin	mg/kg															
γ Hexachlorocyclohexane (gamma-HCH) (lindane) ***OR*** *Total HCH*	mg/kg															
Heptachlor	mg/kg															
Hexachlorobenzene	mg/kg															
o,p'-DDT *(leave empty if total DDT results used)*	mg/kg															
p,p'-DDT ***OR*** *Total DDT*	mg/kg															
γ Trans-Chlordane (gamma) *(leave empty if total Chlordane results used)*	mg/kg															
Chlordecone (kepone)	mg/kg															
Pentachlorobenzene	mg/kg															
Mirex	mg/kg															
Toxaphene (camphechlor)	mg/kg															
Tin																
Tin *(leave empty if Organotin and Tin excl Organotin results used)*	mg/kg															
Organotin																

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315111 Hallenbeagle

TP/WS/BH		HP01	HP02	HP02	HP03	HP03	TP015									
Depth (m)		0.80	0.50	0.80	0.40	0.80	0.50									
Envirolab reference																
Dibutyltin; DiBT	mg/kg															
Tributyltin; TriBT	mg/kg															
Triphenyltin; TriPT	mg/kg															
Tetrabutyltin; TeBT	mg/kg															
Tin excluding Organotin																
Tin excl Organotin	mg/kg															

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ontributes to that Hazardous Property. If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property. If any calculation cells below state "0.

TP/WS/BH		HP01	HP02	HP02	HP03	HP03	TP015								
Depth (m)		0.80	0.50	0.80	0.40	0.80	0.50								
Envirolab reference															
Asbestos in Soil	Thresholds														
Asbestos detected in Soil (enter Y or N)	Y					Y									
		P7						If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7								If
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Carc HP7 % Asbestos in Soil (Fibres)" below	%													
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces) *Please be advised, if the calculation cell is "0.00000" DOES NOT MEAN asbestos testing has been undertaken and the result is zero.*	≥0.1%	0.00000	0.00000	0.00000	0.00000	0.00100	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		where loose fibres or micro pieces are only present. You cannot use			If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.								If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", th		
Asbestos Identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y														
		tP5 and HP7 Construction material containing Asbestos 17 06 05.			If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7 Construction material containing Asbestos 17 06 05.								If visual identifiable pieces of asbestos are present, you cannot us		
		ith the naked eye is "Y", the soil is Hazardous Waste.			Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos Identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.								Therefore, if Asbestos in Soil above is "Y", the Asbes		
		ot Loose Fibres.			Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.								Identifiable Piec		
		ult of <0.1% for the soil to become non-hazardous waste.			All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.								All visual asbestos pieces need to be removed leaving on		
Hazardous Property	Thresholds	Cut Off Value	Hazardous Waste.					If cells below turn yellow and the text turns red, the samples should be classified as Hazardous Waste.							If cells below turn
Corrosive HP8	≥5%	<1%	0.07858	0.06707	0.06742	0.08650	0.08892	0.03390	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Irritant HP4	≥10%	<1%	0.10285	0.09170	0.08992	0.10636	0.11160	0.04639	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Irritant HP4	≥20%	<1%	0.02898	#VALUE!	0.02740	0.02499	0.02859	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥1%		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥20%		0.00000	0.00002	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥1%		0.00307	0.00384	0.00326	0.00307	0.00365	0.00288	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Specifc Target Organ Toxicity HP5	≥10%		0.00560	0.00580	0.00540	0.00510	0.00540	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Aspiration Toxicity HP5	≥10%		0.00000	#VALUE!	0.00000	0.00000	0.00000	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	0.07552	0.06325	0.06417	0.08344	0.08529	0.03104	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥5%	<0.1%	0.00321	0.00398	0.00341	0.00321	0.00379	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥25%	<1%	0.03469	0.03647	0.03292	0.03019	0.03415	0.01999	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.25%	<0.1%	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥2.5%	<0.1%	0.00307	0.00384	0.00326	0.00307	0.00365	0.00288	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥15%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥55%	<1%	0.00011	#VALUE!	0.00012	0.00010	0.00016	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.1%	<0.1%	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥0.5%	<0.1%	0.00320	0.00399	0.00340	0.00319	0.00383	0.00299	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥3.5%	<0.1%	0.00014	0.00014	0.00014	0.00014	0.00014	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Acute Toxicity HP6	≥22.5%	<1%	0.03456	#VALUE!	0.03278	0.03006	0.03395	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7	≥0.1%		0.07550	0.06323	0.06415	0.08342	0.08527	0.03102	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7	≥0.1%		0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
Carcinogenic HP7	≥1%		0.00000	0.00001	0.00000	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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315111 Hallenbeagle

TP/WS/BH			HP01	HP02	HP02	HP03	HP03	TP015									
Depth (m)			0.80	0.50	0.80	0.40	0.80	0.50									
Envirolab reference																	
Carcinogenic HP7 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
pH Corrosive HP8 pH (soil or leachate)	H8 ≥11.5		7.60	7.40	7.40	7.77	8.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
pH Corrosive HP8 pH (soil or leachate)	H8 ≤2		7.08	6.71	7.06	7.60	7.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toxic for Reproduction HP10	≥0.3%		0.00560	0.00580	0.00540	0.00510	0.00540	0.00330	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Toxic for Reproduction HP10	≥3%		0.00307	0.00384	0.00326	0.00307	0.00365	0.00288	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Mutagenic HP11	≥0.1%		0.00307	0.00384	0.00326	0.00307	0.00365	0.00288	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mutagenic HP11 b(a)p marker test (Unknown TPH with ID only) Cell only applicable if TPH >1,000mg/kg	≥0.01%		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Mutagenic HP11	≥1%		0.00162	0.00202	0.00162	0.00202	0.00222	0.00121	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases HP12 Thiocyanate	≥2,600mg/kg		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HP13 Sensitising	≥10%		0.00307	0.00384	0.00326	0.00307	0.00365	0.00288	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14 amended v6	≥25%	<0.1%	#VALUE!	0.13578	0.12793	0.14531	0.15658	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecotoxic HP14 amended v6	≥25%	<0.1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	0.12793	0.14531	0.15658	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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315111 Hallenbeagle																
TP/WS/BH			HP01	HP02	HP02	HP03	HP03	TP015								
Depth (m)			0.80	0.50	0.80	0.40	0.80	0.50								
Envirolab reference																
Ecotoxic HP14 amended v6	≥25%	<0,1% (except Be, V, Te, Tl, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Crosote, TPH, TPHCWG, Phenol, Cresols, Xylenols, T-Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	12.79250	14.53140	15.65840	#VALUE!	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	>0,005%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	>0,0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	>0,0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

If other contaminants need adding to Haswaste, please conta