

JNP GROUP
CONSULTING ENGINEERS

Remediation Strategy

Stone Pit, Dartford

M44049-JNP-XX-XX-RP-G-0002 P03

Taylor Wimpey South East

December 2022

DOCUMENT CONTROL SHEET

Prepared by.....
Hilary Ilsey BSc (Jnt Hons) MSc CBIol MSB SQP SiLC QP
Associate Geo-environmental Scientist

Checker  ...
Sarah Longstatt
Principal Hydrogeologist


 Approved by.....
Daniel Sykes BSc (Hons), MSc, CGeol, FGS
Associate Director

FOR AND ON BEHALF OF JNP GROUP

Date: February 23

Document Issue Record

Rev	Date	Description	Prepared	Reviewed	Approved
P01	21.12.22	Draft Issue	HI	SLL	DRS
P02	06.02.23	Issue for Submission to Regulatory Authorities	HI	HI	DRS
P03	10.02.23	Clarification paragraphs added to sections 1 and 4 . Then issue to Regulatory Authorities.	HI	HI	DRS

This document is for the sole use and reliance of JNP Group's client and has been prepared in accordance with the scope of the appointment of JNP Group and is subject to the terms of that appointment. JNP Group accepts no liability for any use of this document other than by its client and only for the purposes for which it has been prepared. No person other than the client may copy (in whole or in part) or use the contents of this document, without the prior written permission of JNP Group. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of this document as a whole. The copyright at all times remains with JNP Group.

Contents Page

1	INTRODUCTION.....	6
1.2	OBJECTIVES.....	6
1.3	METHODOLOGY.....	6
2	REMEDIATION REQUIREMENTS	8
2.1	POLLUTANT LINKAGES.....	8
2.2	REMEDIATION OBJECTIVES.....	8
2.3	REMEDIATION TARGET VALUES	9
2.4	RE-USE ASSESSMENT AND CRITERIA.....	9
2.5	REMEDIATION MATERIAL VOLUMES.....	11
2.6	HAZARDOUS WASTE ASSESSMENT	12
2.7	UTILITIES.....	12
3	EVALUATION OF REMEDIATION OPTIONS	14
3.1	MANAGEMENT OBJECTIVES AFFECTING REMEDIATION OPTIONS	14
3.2	DESIGN REQUIREMENTS AFFECTING REMEDIATION OPTIONS	14
3.3	TECHNICAL FACTORS AFFECTING SOIL REMEDIATION OPTIONS.....	14
3.4	RE-USE OF SITE WON MATERIAL.....	15
3.5	BEST PRACTICABLE TECHNIQUE FOR SOILS (OUTLINE REMEDIATION STRATEGY).....	15
3.6	BEST PRACTICABLE TECHNIQUE FOR GAS	16
4	REMEDIATION STRATEGY – IMPLEMENTATION PLAN	17
4.1	INTRODUCTION.....	17
4.2	PROGRAMME OF WORKS.....	17
4.3	OVERGROWN VEGETATION AND TREE REMOVAL	18
4.4	DECOMMISSIONING OF EXISTING BOREHOLES.....	18
4.5	MATERIAL REQUIRING EXCAVATION	18
4.6	DEWATERING EXCAVATIONS	19
4.7	SPECIFICS FOR CAPPING LAYER (REAR GARDENS ONLY) AND RE-USE OF SITE WON MATERIAL	20
4.8	IMPORTED FILL	21
5	REMEDIATION STRATEGY – VALIDATION PLAN.....	23
5.1	VALIDATION CHEMICAL TESTING – EXCAVATION OF HOTSPOTS	23
5.2	VALIDATION CHEMICAL TESTING – RE-USE OF SITE-WON STOCKPILE	23
5.3	VALIDATION CHEMICAL TESTING – IMPORTED FILL.....	23
5.4	CAPPING AND FILL LAYER VERIFICATION	25
5.5	GROUNDWATER QUALITY MONITORING (PILING)	25
5.6	GAS MEMBRANE VERIFICATION	26
5.7	VERIFICATION REPORTING.....	26
5.8	RECOMMENDATIONS	26
6	REFERENCES.....	27

List of Figures / Drawings

<i>Figure 1</i>	<i>Key Plan</i>
<i>21968-SP-010 Rev A</i>	<i>gdmarchitects Site Wide Plan</i>
<i>M44049-JNP-XX-ZZ-DR-G-2006 P02</i>	<i>JNP Group Soil Contamination Exceedances in Top 3 m</i>
<i>21968-500-P2</i>	<i>Reuby and Stagg. Earthworks</i>
<i>M440490JNP-XX-ZZ-DR-G-2018P01</i>	<i>JNP Group Localised Soil Remediation Areas</i>

List of Appendices

<i>Appendix A Limitations</i>
<i>Appendix B Hazardous Waste Assessment</i>
<i>Appendix C WAC Testing Results</i>
<i>Appendix D Decommissioning Boreholes</i>
<i>Appendix E Waste License and Permit Register</i>
<i>Appendix F Waste Disposal Records</i>
<i>Appendix G Imported Soil Documentation</i>
<i>Appendix H Gas Membrane Verification</i>

1 INTRODUCTION

- 1.1.1 JNP Group was instructed by Taylor Wimpey South-East to design a remediation strategy for a site known as Stone Pit, Dartford (hereinafter referred to as ‘the site’). This report is subject to the limitations presented in Appendix A.
- 1.1.2 It is understood that the existing site, a restored former quarry, is to be redeveloped with 11, three to four storey residential apartment blocks and circa 420 low rise residential dwellings, including private gardens. Associated infrastructure including access roads, areas of car parking, open areas for attenuation and areas of landscaping will also be provided. The proposed redevelopment layout and phases of work is shown on the Site Wide Plan drawing (reference 21968-SP-010 Rev A, dated January 2023) produced by gdmarchitects.
- 1.1.3 Any comments given are based on the understanding that the proposed redevelopment will be as detailed above.
- 1.1.4 Please note that this Remediation Strategy covers the following areas of development works:
- All soils remediation work in Phase 1, 2 and 3, and spine road;
 - Gas protection requirements for Phases 2 and 3.
- 1.1.5 The gas protection required for Phase 1 are detailed in JNP Group Technical note TN006 (reference M44049-JNP-XX-XX-TN006 P02 Gas Risk Assessment for Phase 1, dated February 2023).
- 1.1.6 It should be noted that if there are any changes to the proposed redevelopment it may affect whether the remediation strategy outlined in this report is still appropriate, and hence warrants further consideration.
- 1.1.7 Should there be any deviation from the agreed remediation strategy, then it may affect whether final discharge of any planning conditions pertaining to the site is granted by the Local Authority.

1.2 Objectives

- 1.2.1 The purpose of this report is to identify the Best Practicable Techniques(s) (BPT) for the remediation of the site. This has been achieved by undertaking an options appraisal of potential remediation techniques and then designing a sustainable remediation strategy including verification plan.

1.3 Methodology

- 1.3.1 This report has been compiled in accordance with the on-line Land contamination: risk management (LCRM) guidance produced by the Environment Agency (June 2019). This can be found on the UK government website: <https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks>.
- 1.3.2 The LCRM guidance outlines a three-stage process in deriving a remediation strategy:
- Identification of Feasible Remediation Options – this considers the general and technical factors that may affect the remedial option as well as the remediation and managerial objectives and produces a short list of potential BPT;

- Detailed Evaluation of Options – this considers the characterisation of the short listed remedial options and remediation costs. An evaluation of environmental attributes is undertaken to select the BPT most suitable for the site;
- Remediation Strategy Design – this identifies the areas of the site requiring remediation and how the works are to be phased. It outlines the verification process and plan which ensure that the remediation works are complete in line with the desired remediation and managerial objectives.

1.3.3 This report should be read in conjunction with the following JNP Group reports:

- M44049-JNP-XX-XX-RP-G-0001 P03 Ground Investigation Report, dated February 2023 (including all technical notes and reports contained within as Appendices);
- M44049-JNP-XX-XX-TN003 P03 Foundation Works Risk Assessment (Piling), dated February 2023;
- M44049-JNP-XX-XX-TN006 P02 Gas Risk Assessment for Phase 1, dated February 2023

2 REMEDIATION REQUIREMENTS

2.1 Pollutant Linkages

2.1.1 From the ground investigation and subsequent assessment, the following contamination has been recorded within the top 3 m of made ground:

- Widespread polycyclic aromatic hydrocarbon (PAH) contamination with respect to selected residential with plant uptake screening values. Three PAH species have been recorded throughout; benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene;
- Localised, elevated concentrations of lead, petroleum hydrocarbons and asbestos with respect to selected residential with plant uptake screening values;
- Deleterious materials (brick, ceramics, concrete, glass, metal, plastic, polystyrene, rope, timber and wood) have been recorded throughout the made ground in varying quantities

2.1.2 These exceedances are shown on Soil Contamination Exceedances drawing M44049-JNP-XX-ZZ-DR-G-2006 P01.

2.1.3 Made ground was found across the whole site in all exploratory hole locations to depths of 1.00 m – >28.45 m below ground level (bgl). The made ground consisted of brown to dark grey sandy gravel and clays. The proportion of clay, sand and gravel varied between exploratory holes, with the majority of the material encountered being cohesive. The gravel fraction comprised variable content of flint, brick, concrete, coal, chalk, quartzite and various deleterious materials.

2.1.4 The material within the mound was similar to the above and homogenous throughout.

2.1.5 In addition, initial post restoration gas monitoring has indicated elevated carbon dioxide and methane concentrations across the site, hence gas protection measures are required. One area associated with DSJ20 in the south south-east corner that warrants further assessment and likely localised remediation. Radon is not of concern at the site.

2.1.6 Hence, remediation at the site is required in areas of private gardens, soft landscaping areas and public open space in order to break the source-pathway-receptor linkages and ensure that the site is suitable for use.

2.2 Remediation Objectives

2.2.1 The overall remediation objective is to ensure that the site is suitable for use and to protect the identified receptors (future site residents).

2.2.2 The following remediation objectives specific to the contaminants apply to the site:

- To remove or reduce the risk to receptors from hydrocarbon and metallic contaminated made ground in all garden areas, areas of soft landscaping and public open space.

2.2.3 The following remediation objectives relating to the remediation option are considered applicable to the site:

- Any amount of material going off site to hazardous landfill must be kept to a minimum;
- To re-use as much site won material possible;

- A sustainable strategy is adopted to promote re-use of site won materials, reduce the amount of imported virgin material, and reduce the number of lorry loads.

2.3 Remediation Target Values

2.3.1 The initial Remedial Target Values (RTV), given in Table 2.1 that follows, have been suggested for the remediation works based on the contaminant failures recorded at the site. In addition, the proposed RTV have been selected to ensure that following remediation the site cannot be classified as “Contaminated Land” under Part IIA of the Environmental Protection Act 1990.

Table 2.1: Proposed RTV

Determinant	RTV (mg/kg)	Source
Lead	200	C4SL (Residential with plant uptake)
Benzo(b)fluoranthene	3.3	S4UL (Residential with plant uptake)
Benzo(a)pyrene	5	C4SL (Residential with plant uptake)
Dibenz(a,h)anthracene	0.28	S4UL (residential with plant uptake)
Total Petroleum Hydrocarbons	250	Professional Judgement
Asbestos	<0.001%	CIRIA C733

2.3.2 The above are for use to demonstrate that those areas being remediated and validated are now free from contamination.

2.4 Re-Use Assessment and Criteria

2.4.1 The original JNP assessment contained within the Ground Investigation Report (M44049-JNP-XX-XX-RP-G-0001-P03) was based on a residential end use using conservative residential with plant uptake screening values for direct comparison against the soil concentration results.

2.4.2 However, from a review of the proposed Site Wide Plan drawing (reference 21968-SP-010-Rev A, dated January 2023), it can be seen that there are areas of the site that will be public open space, landscaping corridors and front gardens which are considered to be less sensitive. Therefore, consideration has been given as to whether site won cut material that is acceptable to less sensitive residential criteria can be re-used in this area, offering a sustainable re-use of site won material.

2.4.3 Looking at the soils data set (JNP Group and Arcadis recent data) for the top 3 m of made ground for the three PAHs present (benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene), there are a total of 223 data points spatially across the site. Given that the made ground is generally similar across the site with no obvious source for the PAH contaminations, the number of data points and the fact that the cut works will generate stockpiles of site material, the calculation of an average concentration is considered to be appropriate for use in this assessment for less sensitive residential areas of the site.

2.4.4 Individually and average concentrations of these three PAH species have been assessed against published screening values for residential without plant uptake and Public Open Space_{resi} (POS_{resi}) scenarios. This assessment is summarised in the table that follows.

Table 2.2 Re-Use Assessment

PAH	Screening value (mg/kg)	Source	No . of individual failures	Average concentration (mg/kg)	Average failure?
Benzo(b)fluoranthene	4.0	S4UL Residential without plant uptake 2.5 % SOM	13	1.77	No
Benzo(a)pyrene	3.2		20	1.52	No
Dibenz(a,h)anthracene	0.32		29	0.30	No
Benzo(b)fluoranthene	7.2	S4UL Public Open Space _{resi} 2.5 % SOM	1	1.77	No
Benzo(a)pyrene	5.7		1	1.52	No
Dibenz(a,h)anthracene	0.57		12	0.30	No

- 2.4.5 Whilst there are individual failures against both the residential without plant uptake and the POS_{resi}, screening values, considering an average concentration the results are acceptable.
- 2.4.6 The dataset for the mound present in the north-west corner has also been assessed in a similar manner. There was a total of seven results that gave an average arsenic concentration of 12.27 mg/kg, this is acceptable considering residential with plant uptake, residential without plant uptake and POS_{resi} screening values of 37 mg/kg, 40 mg/kg and 79 mg/kg respectively and hence is considered suitable for re-use in such areas.
- 2.4.7 Therefore, JNP Group consider the site won material from the cut works including the mound area is suitable for use in public open space, landscaped corridors, front and rear gardens areas in accordance with the provisions given in the table below.

Table 2.3: Re-Use Scenarios

Scenario	Fill Requirements
Rear gardens areas	150 mm* clean, imported topsoil 300 mm* screened site won material from mound, with some random validation testing to demonstrate average suitability
Front gardens areas	150 mm* clean, imported topsoil 100 mm* screened site won material from cut, with some random validation testing to demonstrate average suitability
Landscaping corridors	150 mm* clean, imported topsoil 100 mm *screened site won material from cut with some random validation testing to demonstrate average suitability
Public Open Space	150 mm *clean, imported topsoil 100 mm* screened site won material from cut with some random validation testing to demonstrate average suitability

*The thicknesses may differ if required providing they meet with the overall thickness requirement and the quality requirements.

2.5 Remediation Material Volumes

- 2.5.1 Localised areas of lead, petroleum hydrocarbons and asbestos have been identified at the site. These are shown on JNP Group Localised Soil Remediation Areas drawing M44049-JNP-XX-ZZ-DR-G-2018 P01. In many of these locations there was elevated PAH contamination present as well and hence this will be removed at the same time.
- 2.5.2 Each hotspot area is to be excavated extending to an initial area of 25 m² centred around the original exploratory hole location and excavated to the suggested depth as per the table below.

Table 2.4: Proposed Remediation Volumes

Location (+ contaminant)	Suggested Depth (m)	Estimated Volume (m ³)
TPJ01 (petroleum hydrocarbons @1 m)	1.5	37.5
DSJ01 (lead @ 1.1 m)	1.5	37.5
BHJ06 (PAH @ 1.5 m, petroleum hydrocarbons @ 2.2 m)	2.5	62.5
TPJ45 (asbestos @ 0.3 m, PAH @ 2.2 m)	2.5	62.5
BHJ09 (lead @ 0.6 m)	1.0	25
TPJ43 (petroleum hydrocarbons @ 0.5 m)	1.0	25
TPJ07 (PAH @ 0.4 m, asbestos at 0.7m)	1.0	25
DSJ03 (PAH and petroleum hydrocarbons at 1.2 m)	1.5	37.5
TP10 (lead and PAH at 0.5 m)	1.0	25
BHJ10 (PAH @ 0.3 m, lead and PAH @ 1.2 m)	1.5	37.5
TP12 (PAH and petroleum hydrocarbons at 0.5 m)	1.0	25
TP16 (lead and PAH @ 0.5 m)	1.0	25
TP17 (asbestos @ 0.5 m)	1.0	25
TPJ21 (lead @ 1.9 m)	0	50
TPJ23 (lead @ 0.8 m)	1.0	25
TP23 (asbestos @ 0.5 m)	1.0	25
DSJ13 (PAH and petroleum hydrocarbons @ 0.8 m)	1.0	25
TPJ26 (lead @ 1.2 m)	1.5	37.5
TP26 (asbestos and PAH @ 0.5 m)	1.0	25
BHJ17 (petroleum hydrocarbons @ 0.5 m)	1.0	25
TPJ46 (petroleum hydrocarbons @ 0.5 m)	1.0	25
TPJ40 (PAH and petroleum hydrocarbons @ 0.5 m)	1.0	25
DSJ16 (lead and PAH @ 0.6 – 1.2 m)	1.5	37.5
TPJ38 (lead and PAH @ 1.4 m)	1.5	37.5
DSJ19 (petroleum hydrocarbons @ 1.0 m)	1.5	37.5

- 2.5.3 This equates to a current estimated volume of 825 m³ of material requiring remediation. All volumes exclude bulking factors.

2.5.4 It must be stressed that this is an approximation volume of material to be remediated and a contingency should be allowed for in the event that either, following validation, more contamination requires removal or unexpected contamination is identified during the redevelopment works.

2.5.5 The anticipated small volume of material requiring remediation, clayey strata and presence of asbestos at some location is likely to warrant on-site treatment methods unviable at the site.

2.6 Hazardous Waste Assessment

2.6.1 The concentrations of contaminants recorded during the ground investigation have been assessed using the HazWasteOnline classification tool. This classification tool is based on the methodology outlined in the Hazardous Waste Technical Guidance publication WM3 (EA, SEPA, NIA, NRW. May 2015).

2.6.2 The concentrations of contaminants within the made ground are considered to be non-hazardous. There was one potentially hazardous result for the TPH concentration, however, this assumed the presence of liquid oil, which is not present on site, and hence can be classed as non-hazardous.

2.6.3 The asbestos concentrations recorded during the ground investigation ranged between 0.001 % and 0.025 %, as this is below 0.1 %, the asbestos at the site is not considered to be hazardous.

2.6.4 A copy of the hazardous waste assessment is included in Appendix B.

2.6.5 Waste acceptance (WAC) testing is not required for the disposal of non-hazardous waste, however, from the sixteen WAC tests undertaken during the ground investigation, the made ground is potentially suitably at an inert landfill, subject to agreement by any waste receiver.

2.6.6 If any material is removed off site for disposal as non-hazardous waste at an inert waste disposal facility, then it is suggested that the WAC testing results are issued to the waste receiver for them to decide. Copies of the WAC testing are included as Appendix C.

2.7 Utilities

2.7.1 Four electricity cable routes cross the site as overhead cables. A 400 kV main pylon crosses the north of the site and the eastern section, in a north-west to southeast direction. Parallel to this, approximately 100 m to the west, are two 128 kV overhead pylon routes. No pylon structures are present within the site boundaries. A smaller 11 kV overhead line crosses the narrowest part of the site at the bend of the 'L' shape in a north to south direction.

2.7.2 The base of a former electricity pylon is present approximately 150 m south of the north-east corner of the site. A concrete block and cut-off steel is present.

2.7.3 An underground Esso fuel pipeline crosses the north of the site in an east to west direction, approximately 2 m south of the site boundary. There is no surface expression of the pipeline and it is anticipated to be present at a depth.

2.7.4 Working practices, such as adopting easement zones and undertaking any vibration monitoring, during the redevelopment works will have to be utilised and incorporated into the Contractors' RAMS.

- 2.7.5 It will be the responsibility of the contractor to ensure that liaison with the appropriate utility provide has been undertaken ahead of any excavation work and that safe working practices are all agreed. This section is not intended to be a full risk assessment of the works to be undertaken but to raise awareness of the issues as we understand them currently. The Contractor will be fully responsible for their safe system of work.

3 EVALUATION OF REMEDIATION OPTIONS

3.1 Management Objectives Affecting Remediation Options

3.1.1 The following management objectives are considered to be appropriate for the site:

- To reduce the amount of hazardous waste being landfilled in line with current UK waste hierarchy (reduce – re-use – recycle – recover – disposal);
- To achieve a remediation strategy that can be agreed by all key stakeholders (client, regulators);
- To meet all regulatory requirements relevant to the installation or operation of remediation options;
- To avoid unacceptable health and safety, and adverse environmental impacts during remediation;
- To minimise long term liabilities;
- To avoid long term maintenance or monitoring obligations;
- To ensure the scheme takes into account any design requirements of the overall redevelopment;
- To undertake remediation in accordance with good technical practice;
- To achieve successful remediation within a particular timescale and budget.

3.2 Design Requirements Affecting Remediation Options

3.2.1 Extensive cut and fill requirements are required as part of the redevelopment works. These are shown on Reuby and Stagg Earthworks drawing (reference 21968-500-P2, dated September 2022).

3.3 Technical Factors Affecting Soil Remediation Options

3.3.1 Contaminant type and soil type are the two key factors that affect the choice of any remediation option being considered.

3.3.2 To treat clay soils contaminated with hydrocarbons and metals, the following are options:

- Biological: slurry phase bioremediation;
- Chemical: accelerated natural attenuation;
- Solidification / stabilisation: cement and pozzolan based system; eclays, vitrification;
- Other: cover; disposal to landfill;
- Other: transfer to soil treatment centre.

3.3.3 Given the low concentrations of PAH recorded across the site and the presence of small hotspots, on site treatment methods such as biological, chemical or solidification methods are not considered feasible at the site.

3.3.4 The following are appropriate for asbestos:

- Cover-containment (should there be an option to raise ground levels and subject to regulatory approval);

- Excavation and transfer to a soil treatment centre (some centres can accept low concentrations of asbestos);
- Excavation and disposal to landfill.

3.4 Re-use of Site Won Material

- 3.4.1 The re-use of site won material from the cut exercise has been discussed in Section 2.4 and it has been demonstrated that providing site won material has been physically screened to separate out any deleterious material and undergoes some random validation testing. It can be reused in front garden areas, landscaping corridors and public open spaces areas.
- 3.4.2 The material from the mound has been deemed suitable for re-use in rear garden areas providing it has been physically screened to separate out any deleterious material and undergoes some random validation testing.
- 3.4.3 Other site won material, providing it has been screened and is suitable geotechnically, can be re-used under hard standing and buildings if required. This material does not require any chemical validation testing.
- 3.4.4 Whilst a conservative assessment for the most sensitive rear gardens areas has been undertaken, given the average concentrations and lack of point source of PAH contamination identified, should a capping layer be selected for use at the site as part of the remediation, a thickness of 450 mm would be sufficient underlain by a suitable geotextile. Material underlying this to 600 mm or deeper could also comprise screened site won material.
- 3.4.5 The re-use of site won material is a sustainable methodology to reduce the amount of material requiring removal off site, reducing the need to import virgin material and to reduce the associated number of lorry movements associated with the proposed development.
- 3.4.6 It is recommended that the re-use of site won material and management thereof is undertaken in accordance with the Environmental Permitting Regime.

3.5 Best Practicable Technique for Soils (Outline Remediation Strategy)

- 3.5.1 Given the contamination present, soil type and considering the cut and fill requirements, as discussed above, JNP Group consider that a combination of methods is incorporated into the Remediation Strategy.
- 3.5.2 Therefore, the following outline Remediation Strategy is proposed:
- Excavation of hotspots and removal to soil treatment centre (this will avoid Landfill Tax charges) or suitable landfill as non-hazardous waste. Based on the WAC results there may be scope for disposal at an inert landfill which is a cheaper disposal option (subject to agreement by the waste receiver);
 - Re-use of clean site won material to a fill depth of 250 mm in areas of front gardens, public open space and landscaped corridors following physical screening to remove deleterious material and random validation compliance testing to a suggested thickness of 150 mm and then placement of 100 mm (suggested thickness) of clean, imported topsoil;
 - Use of a clean fill, 450 mm thick capping layer in residential rear garden areas, which is to comprise 150 mm (suggested thickness) of clean, imported topsoil, 300 mm (suggested thickness) of physically screened site won mound soil (including random

validation compliance testing) and / or clean, imported subsoil underlain by a suitable geotextile membrane.

3.5.3 This has been summarised in the table that follows:

Table 4.1: Remediation Strategy Summary

Scenario	Remediation Strategy	
General Site	Excavate and Dispose	Removal of hotspots as detailed in Table 2.4 and shown on drawing M44049-XX-ZZ-DR-G-2018 P01 to a suitable waste receiver. Chemical validation testing to demonstrate hotspot has been removed.
Rear gardens areas	Capping Layer	150 mm* clean, imported topsoil 300 mm* screened site won mound material, with some validation testing and / or clean, imported subsoil Puncture resistance geotextile membrane
Front gardens areas	Clean Fill	150 mm* clean, imported topsoil 100 mm* screened site won material from cut, with some random validation testing.
Landscaping corridors		150 mm* clean, imported topsoil 100 mm* screened site won material from cut with some random validation testing.
Public Open Space		150 mm* clean, imported topsoil 100 mm* screened site won material from cut with some random validation testing.
Hard standing / under buildings		Screened site won material.

*The thicknesses may differ if required providing they meet with the overall thickness requirement and the quality requirements.

3.6 Best Practicable Technique for Gas

- 3.6.1 Gas protection measures will be required at the site. The indication thus far is that this will be a mix of CS2 (NHBC Amber 1) and CS3 (NHBC Amber 2), however, subject to a zoning approach being accepted by the Regulatory Authorities, there may be areas of CS1 (NBCC green) where no gas protection measures are required. Hydrocarbon resistance gas membranes may be required in parts of the site
- 3.6.2 There is also one area in the south-east corner where remediation or detailed risk assessment is likely to be required in terms of removal of material deemed to be causing the spike in gas results.
- 3.6.3 Radon gas protection is not a requirement at the site.
- 3.6.4 Gas monitoring is currently on going and the level of gas screening required will be re-assessed in three months' time when there is more gas data available.

4 REMEDIATION STRATEGY – IMPLEMENTATION PLAN

4.1 Introduction

- 4.1.1 The main works shall be undertaken by a suitably qualified earthworks Contractor and the works shall be supervised by JNP Group on an “as and when” required basis.
- 4.1.2 As there is asbestos present within the soils, all works undertaken must be in accordance with the guidance given in the CIRIA C733 (CIRIA 2014) and CL:AIRE Industry Guidance on Interpretation for Managing & Working with Asbestos in Soil and Construction and Demolition Materials (CL:AIRE 2016). The earthworks Contractor must be licensed to work with asbestos containing materials.
- 4.1.3 All works on site shall be undertaken following the guidance given in C762 Environmental Good Practice on-site (CIRIA C762) and Construction Site Safety GE700E/18 (CITB 2018).
- 4.1.4 A Construction Environmental Management Plan (CEMP) and method statements for all aspects of work shall be provided to JNP Group by the earthworks Contractor, and any specialised subcontractors. These will include any details of proposed toolbox talks. The CEMP and method statements shall require approval prior to commencement of the works on site. The CEMP should cover, as a minimum, the following items: nuisance dust; asbestos fibres release; odours; noise and traffic management.
- 4.1.5 It is recommended that the proposed works are undertaken in accordance with the an appropriate waste management regime such as Environmental Permitting or the Definition of Waste Code of Practice.

4.2 Programme of Works

- 4.2.1 In order to ensure the works are undertaken in a suitable order, the following are proposed:
- Surface strip, vegetation clearance and identification of existing boreholes for decommissioning;
 - Decommissioning of existing boreholes (not required for monitoring);
 - Excavation of remediation hotspots;
 - Excavation of cut areas, with stockpiling of suitable material for re-use in accordance with the material management plan.
 - Physical screening of site won material to remove deleterious materials;
 - Excavation of ground for drainage attenuation tanks;
 - Re-use of site won material in areas of fill and placement of agreed capping (where appropriate);
 - Removal of surplus material to a designated waste receiver;

- Commencement of piling work;
 - Provision of piling mat;
 - Removal or re-use of material on site;
 - Any drainage / services work;
 - Construction phase – foundations and gas protection measures;
 - Placement of topsoil.
- 4.2.2 Once the works commence, on-going activities will include excavation, materials movement, validation testing, filling, compaction; and on going gas monitoring (if required).
- 4.3 Overgrown Vegetation and Tree Removal**
- 4.3.1 The requirements for overgrown vegetation and tree removal will be under the management of the appointed ecological consultant.
- 4.4 Decommissioning of Existing Boreholes**
- 4.4.1 As a result of the numerous phases of ground investigation that have been undertaken at the site, there is the potential for numerous boreholes from previous investigations to remain in-situ, having not been decommissioned.
- 4.4.2 A surface search supervised by JNP Group will be undertaken following the surface strip to identify any such locations. These shall be marked with orange wooden pegs to await decommissioning, which shall be undertaken prior to any excavation work by a specialist contractor.
- 4.4.3 Each borehole is to be decommissioned in accordance with the EA guidance, as summarised in Appendix D, to avoid leaving possible preferential pathways. Any additional boreholes encountered during the works will be decommissioned in a similar manner.
- 4.4.4 Upon completion of all piling groundwater monitoring and any ongoing gas monitoring, all monitoring boreholes will also require decommissioning as per Appendix D. The groundwater monitoring well decommissioning will not be undertaken until the Environment Agency confirm that the groundwater quality following the completion of the piling works at the site is acceptable and that no more monitoring is required.
- 4.5 Material Requiring Excavation**
- 4.5.1 The hotspot areas requiring excavation is shown on drawing M44049-JNP-XX-ZZ-DR-G-2018 P01. If practicable, the ground requiring excavation shall be directly excavated onto haulage lorries or if this is not achievable stockpiled in a designated area to await disposal. Any stockpiled material shall be placed on tarpaulin sheets to avoid any cross contamination.
- 4.5.2 All cut material will be stockpiled in a designated area of the site to await physical screening, once screened it will be stockpiled in another designated part of the site to await random compliance validation testing and re-use.
- 4.5.3 Given that the material from the mound is suitable for use in rear gardens, this material will be stockpiled in a designated area of the site to await physical screening, once screened it

will be stockpiled in another designated part of the site to await random compliance validation testing and re-use.

- 4.5.4 All stockpiled material shall be placed on tarpaulin sheets to avoid any cross contamination.
- 4.5.5 Should unexpected contamination require excavation as directed by JNP Group, then the earthworks contractor shall make the necessary arrangements with the waste receiver and programme in further excavation work.
- 4.5.6 Records shall be kept of any material removed off-site either for treatment and re-use or as a waste destined for landfill. The Waste License and Permit Register form, as given in Appendix E, detailing the waste codes, haulier and waste receiver details should be completed by the Contractor for each waste material generated requiring removal. In addition, all material removed off-site shall be logged on the Waste Disposal Log form given in Appendix F. The completed waste management form, duty of care and consignment notes shall be provided to JNP Group for inclusion in the verification report.

4.6 Dewatering Excavations

- 4.6.1 It is likely that pockets of perched groundwater within the made ground will be encountered during the excavation work. Periods of inclement weather may also affect excavations. The following should be undertaken to assist with the control of water in excavations:
- Work on one or a few areas at a time to avoid too many deep or large excavations being open at once;
 - Ensure there is on-site storage of suitable materials and equipment to construct a temporary storage tank(s);
 - Ensure on-site storage of suitably powered pumps and sufficient lengths of hoses to enable dewatering of excavation as and when required.
- 4.6.2 This water will require collection and on-site treatment by the remediation Contractor prior to suitable disposal. Such water is likely to contain dissolved and suspended contamination, suspended solids; therefore, the water is unsuitable for the following:
- Use as dust suppression water;
 - Direct disposal to the ground.
- 4.6.3 The preferred disposal option is for disposal to sewer; the quality of the water should meet with the discharge criteria provided by Thames Water and should also be discharged in accordance with their discharge rates. This will require agreement from Thames Water before any water can be discharged to sewer.
- 4.6.4 It will be the responsibility of the remediation Contractor to undertake the chemical testing of the output water to demonstrate compliance with Thames Waters' discharge criteria.
- 4.6.5 Regular site walkovers should be undertaken throughout the day to check the water level within excavations.
- 4.6.6 Correct duty of care procedures must be followed regarding the transfer and disposal of water. Copies of the relevant duty of care transfer notes, haulier and waste facilities information (address and copies of Environmental Permits), groundwater validation testing,

and water discharge chemical testing results will be provided by the Principal Contractor to JNP Group for inclusion in the final Verification Report.

4.7 Specifics for Capping Layer (rear gardens only) and Re-use of Site Won Material

4.7.1 A clean capping layer is required in all rear gardens areas and should comprise a geotextile membrane (puncture resistant) at the base then 300 mm of screened site won mound material and / or clean, imported subsoil and 150 mm of clean, imported topsoil. Should the Contractor prefer, the thicknesses of topsoil and subsoil can vary but they must total 450 mm.

4.7.2 If levels require, the geotextile can be underlain by site won material.

4.7.3 The cut material is to be stockpiled for re-use as fill across the site. This material is to be physically screened to remove any deleterious material. Validation compliance chemical testing shall also be undertaken on this material, at a rate of one test per 500 m³ to demonstrate average acceptability of the material for use as fill elsewhere on site. This is summarised in the table below.

Table 4.1: Capping / Fill Requirements

Scenario	Overall Capping / Fill Required Depth	Capping / Fill Requirements
Rear gardens areas	450 mm	150 mm* clean, imported topsoil 300 mm* screened site won mound material, with some validation testing and / or clean, imported subsoil Puncture resistance geotextile membrane
Front gardens areas	250 mm	150 mm* clean, imported topsoil 100 mm* screened site won material from cut, with some random validation
Landscaping corridors	250 mm	150 mm* clean, imported topsoil 100 mm* screened site won material from cut with some random validation testing
Public Open Space	250 mm	150 mm* clean, imported topsoil 100 mm* screened site won material from cut with some random validation testing
Hard standing / under buildings	None	Screened site won material.

4.7.4 *The thicknesses may differ if required providing they meet with the overall thickness requirement and the quality requirements.

4.7.5 The requirements of section 4.11 also apply.

4.8 Imported Fill

- 4.8.1 Any imported fill such as subsoil or topsoil used at the site should be sourced from a suitable provider of such material, who should provide chemical testing certificates of the material destined for the site. At least one certificate needs to be less than two months old. These certificates should be issued to JNP Group for approval prior to accepting the material. In addition, the imported fill should be free of any deleterious material such as glass fragments, wire, wood and a visual inspection should be undertaken once the material arrives on site.
- 4.8.2 Any topsoil and subsoil imported to site shall be classified and characterised in accordance with the requirements of BS3882:2015 [Specification for topsoil and requirements for use] and BS8601:2013 [Specification for subsoil and requirements for use] respectively as well as the chemical testing criteria given in Tables 5.1 and 5.2.
- 4.8.3 The reader is referred to Section 5 for chemical testing requirements which are in addition to the above.
- 4.8.4 Records of any imported soils brought to site shall be kept by the Contractor using a form such as that included in Appendix G.

4.9 Construction Phase – Potential Gas Protection Measures for Phase 2 and 3.

- 4.9.1 Based on the initial gas monitoring and assessment undertaken, where a CS2 determination is considered appropriate, gas mitigation measures with a score of at least 3.5 points are required for the proposed development in the CS2 areas of the site. Based upon the options available within BS 8485: 2015 +A1 2019, the following ground gas protection measures are suggested:
- Good performance passive sub-floor ventilation (venting can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) - 1.5 points;
 - Traditional beam-and-block floor – 0 points or Cast-in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations – 1 point;
 - Installation of gas resistant membrane fulfilling all requirements within Table 7 of BS8485 (2015 +A1 2019), with verification in accordance with CIRIA C735 – 2 points.
- 4.9.2 On the basis of the results so far, where a CS3 determination is considered appropriate, gas mitigation measures with a score of at least 4.5 points are required for the proposed development in the CS3 areas of the site. Based upon the options available within BS 8485: 2015 +A1 2019, the following ground gas protection measures are suggested:
- Good performance passive sub-floor ventilation (venting can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) - 1.5 points;
 - Cast-in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations – 1 point;
 - Installation of gas resistant membrane fulfilling all requirements within Table 7 of BS8485 (2015 +A1 2019), with verification in accordance with CIRIA C735 – 2 points.
- 4.9.3 There is one area around borehole DSJ20 that is currently anticipated to require remedial works to reduce the gas risk in this area.

4.9.4 Gas monitoring is ongoing and the gas assessment and requirement for gas protection measures will be re-assessed in three months' time when there is more data to review.

4.10 Dealing with Unexpected Contamination

4.10.1 Whilst investigation works has been undertaken at the site, it remains possible that unexpected soil, groundwater contamination or visible asbestos containing materials may be encountered during the process of any clearance, earthworks and / or construction.

4.10.2 There is the potential for areas of previously unidentified and unexpected contamination to be present at the site such as ashy soils, brightly coloured soil, significantly oily or odorous material, asbestos impacted soils and underground tanks.

4.10.3 If during the works such material is encountered, then the earthworks Contractor shall inform JNP Group immediately who shall then advise on the best course of action. Photographic and written records should be kept by the earthworks Contractor detailing any such material.

4.10.4 Dartford Borough Council's Environmental Health Department should also be made aware of any expected contamination encountered and how it is to be managed.

4.10.5 A copy of this strategy for dealing with unexpected contamination should be made available on site and ground workers should be made aware of it.

4.11 Environmental Incidents

4.11.1 In the event of an unforeseen environmental incident (pollution occurrence) on-site work should be stopped in the area immediately affected and the Environmental Agency should be contacted via their incident hotline - 0800 807 060.

4.11.2 Emergency spill kits shall be kept on-site in strategic locations and a member of staff who is trained to use them shall be present on-site at all times.

5 REMEDIATION STRATEGY – VALIDATION PLAN

5.1 Validation Chemical Testing – Excavation of Hotspots

- 5.1.1 Following excavation of the hotspot areas, the resulting excavation bases and faces shall be sampled at random locations by JNP Group to suit the size of the excavation, and the samples sent for chemical analysis for either asbestos, lead, PAH or total petroleum hydrocarbons (as indicated in Table 2.4). Providing the chemical results are acceptable to the screening values given in Table 2.1, the area can then be backfilled with suitable site won material or imported fill.
- 5.1.2 Should the chemical results fail, then further material shall be excavated (it is suggested by 200 mm in all directions) and the new excavation level sampled and tested as above.
- 5.1.3 Following the excavation of any unexpected contamination, soil samples shall be taken by JNP Group and tested for an appropriate testing suite. The results shall be compared to the criteria given in Tables 5.1 and 5.2 and provided they are acceptable, the area can be backfilled. If not acceptable, the excavation should be extended as above and the new perimeter re-sampled.
- 5.1.4 All chemical testing shall be undertaken by a UKAS and MCERTS accredited testing laboratory using standard turnaround times.

5.2 Validation Chemical Testing – Re-use of Site-won Stockpile

- 5.2.1 Site won stockpiled material will sampled with random composite soil samples being taken at a rate of one test per 500 m³ of physically screened cut material. Samples shall be scheduled for tested of speciated PAH only. This sampling shall be undertaken by JNP Group.
- 5.2.2 The results from the mound stockpiles will be compared to the criteria in Table 2.1 for residential with plant uptake scenario. The results from all other site won stockpiles will be compared to the criteria in Table 2.2 for residential without plant uptake and POS_{resi} scenarios so its re-use location can be decided. Concentrations will be reviewed from an average perspective. The contractor will keep records of all compliance testing and where material has been replaced.
- 5.2.3 All chemical testing shall be undertaken by a UKAS and MCERTS accredited testing laboratory using standard turnaround times.

5.3 Validation Chemical Testing – Imported Fill

- 5.3.1 Chemical testing certificates should be available for any imported fill including subsoil or topsoil, however, in line with the requirements of the NHBC guidance, as the number of plots scheduled for development is greater than forty, each imported material used must have a minimum of ten tests but also one per four plots, whichever is the greater. Whilst there should be testing prior to importation to give confidence on the material, the material should be fully tested as detailed here once imported. If imported and not immediately placed then this should be suitably stockpiled and quarantined following best practice. This sampling shall be undertaken by JNP Group.
- 5.3.2 All chemical testing shall be undertaken by a UKAS and MCERTS accredited testing laboratory.

5.3.3 Any chemical testing results shall be compared to the screening values given in Table 5.1. For conservatism, current UK residential with plant uptake guideline values have been selected for use.

5.3.4 In addition, as copper, nickel and zinc are considered phytotoxic in nature, the criteria given in Table 5.2 should be used (these values are less than the published UK screening values and hence are considered protective of human health).

Table 5.1: Imported Fill Screening Values

Determinant	Screening Criteria (mg/kg)	Source	Determinant	Screening Criteria (mg/kg)	Source
TPH Aliphatic C ₅ – C ₆	42	LQM S4UL	Acenaphthylene	5.0	Professional judgement ⁶
TPH Aliphatic C ₆ – C ₈	100	LQM S4UL	Acenaphthene	5.0	Professional judgement ⁶
TPH Aliphatic C ₈ – C ₁₀	27	LQM S4UL	Anthracene	5.0	Professional judgement ⁶
TPH Aliphatic C ₁₀ – C ₁₂	130	LQM S4UL	Benzo(a)anthracene	5.0	Professional judgement ⁶
TPH Aliphatic C ₁₂ – C ₁₆	250	Professional judgement ¹	Benzo(a)pyrene	5.0	Defra C4SL ⁴
TPH Aliphatic C ₁₆ – C ₂₁	250	Professional judgement ¹	Benzo(b)fluoranthene	2.6	LQM S4UL
TPH Aliphatic C ₂₁ – C ₃₅	250	Professional judgement ¹	Benzo(k)fluoranthene	5.0	Professional judgement ⁶
TPH Aromatic C ₅ – C ₇	0.87	Professional judgement ⁶	Benzo(g,h,i)perylene	5.0	Professional judgement ⁶
TPH Aromatic C ₇ – C ₈	130	LQM S4UL	Chrysene	5.0	Professional judgement ⁶
TPH Aromatic C ₈ – C ₁₀	34	LQM S4UL	Dibenzo(a,h)anthracene	0.24	LQM S4UL
TPH Aromatic C ₁₀ – C ₁₂	74	LQM S4UL	Fluoranthene	5.0	Professional judgement ⁶
TPH Aromatic C ₁₂ – C ₁₆	140	Professional judgement ¹	Fluorene	5.0	Professional judgement ⁶
TPH Aromatic C ₁₆ – C ₂₁	260	Professional judgement ¹	Indeno(1,2,3,c-d)pyrene	5.0	Professional judgement ⁶
TPH Aromatic C ₂₁ – C ₃₅		Professional judgement ¹	Naphthalene	2.3	LQM S4UL
			Pyrene	5.0	Professional judgement ⁶
Arsenic	37	Defra C4SL ⁴	Phenanthrene	5.0	Professional judgement ⁶
Cadmium	26	Defra C4SL ⁴			
Chromium	910 ²	LQM S4UL	Nickel	pH dependent	Refer to Table 5.2
Mercury	40 ³	LQM S4UL	Selenium	250	LQM S4UL
Lead	200	Defra C4SL ⁴	Benzene	0.87	Defra C4SL ⁴

Determinant	Screening Criteria (mg/kg)	Source	Determinant	Screening Criteria (mg/kg)	Source
Copper	pH dependent	Refer to Table 5.2	Toluene	130	LQM S4UL
Zinc	pH dependent	Refer to Table 5.2	Ethylbenzene	47	LQM S4UL
asbestos	None present	CIRIA C733	Xylene	56 ⁵	LQM S4UL

LQM S4UL selected for organics based on 1% SOM for conservatism

- 1 Professional judgement – conservative value selected, less than LQM S4UL
- 2 Based on LQM S4UL for chromium III, assumes no chromium VI is likely to be present
- 3 Based on LQM S4UL for inorganic mercury, assumes that no elemental or methyl mercury is likely to be present
- 4 defra category 4 screening value
- 5 Based on LQM S4UL for p-xylene for conservatism
- 6 Professional judgement – cannot be classified as contaminated land under Part IIA

Table 5.2: Imported Fill Screening Values- phytotoxic metals

Determinant	Screening Criteria (mg/kg)			Source
	pH <6	pH 6-7	pH >7	
Copper (nitric acid extractable)	<100	<135	<200	BS 3882:2015 and BS 8601:2013
Nickel (nitric acid extractable)	<60	<75	<110	BS 3882:2015 and BS 8601:2013
Zinc (nitric acid extractable)	<200	<200	<300	BS 3882:2015 and BS 8601:2013

5.4 Capping and Fill Layer Verification

- 5.4.1 In rear gardens, the depth and quality of the capping layer shall be verified, along with the presence of the geotextile using the same frequency as the topsoil testing of one every four plots.
- 5.4.2 In the front gardens, landscaped and open space areas, the depth and quality of the site won fill and imported topsoil will be verified. Within front garden areas this will be one in every eight plots, and within landscaping corridors and public open space areas ten random locations in each will be chosen across the site.
- 5.4.3 This verification work will be undertaken by JNP Group.

5.5 Groundwater Quality Monitoring (Piling)

- 5.5.1 In accordance with the Foundation Works Risk Assessment (Piling) Technical Note (M44049-JNP-XX-XX-TN003 P03), water quality monitoring at the up and down gradient boreholes (BH7, BH17, BH1, and BH15) along the site boundaries will be undertaken on a fortnightly basis prior to, during and after the piling activities.
- 5.5.2 The water samples taken shall be analysed for a standard suite of analytes comprising heavy metals, ammonium, nitrites and speciated PAHs. Selected samples shall be analysed for pH, hardness, calcium and dissolved organic carbon. This strategy will be agreed with the Environment Agency who will also confirm the required period of post piling monitoring.
- 5.5.3 All chemical testing shall be undertaken by a UKAS and MCERTS accredited testing laboratory.

5.6 Gas Membrane Verification

5.6.1 Ground gas monitoring is ongoing and the risks from ground gas will be re-assessed in three months' time when more data is available.

5.6.2 If gas protection measures are required, the following would likely to be implemented:

- All testing and verification of the membrane shall be in accordance with the good practice guide Table A3 given in CIRIA C735. Following the completion of all the installation work and integrity testing (where required), all records of work undertaken, photographs, integrity testing recorded, Certificates of Conformity, and copies of the CSWIP Approval Certificates for all relevant installation welders, shall be provided to JNP Group for inclusion in the Verification Plan.
- All work shall be verified in accordance with the requirements of the Gas Verification Report as given in Appendix H. In addition, the Verification Proforma, also given in Appendix H shall be completed by the installer.
- A photographic record of the installation work shall be kept by the installer. In addition, appropriate records of all the Integrity Testing undertaken shall be produced by the installer.
- Independent verification of the gas membranes in all properties shall be undertaken by an appropriate third party. Following completion of the validation, copies of the validation report / certificates shall be submitted to JNP Group for inclusion in the Verification Report.

5.7 Verification Reporting

5.7.1 Following the completion of the remediation works all records of works undertaken (including drawings and photographs), borehole decommissioning records, gas membrane certificates of conformity, duty of care certificates, imported soil chemical testing certificates shall be provided to JNP Group.

5.7.2 Following the completion of the remediation works a verification report shall be produced by JNP Group that details the remediation work undertaken, the validation testing undertaken, and the details of any material removed from or brought to the site.

5.7.3 It is recommended that a copy of this report is submitted to the regulatory authorities for their approval.

5.8 Recommendations

5.8.1 It is recommended that a copy of this options appraisal and remediation strategy be submitted to the Regulatory Authorities for their approval.

6 REFERENCES

- 1 BRE 2005: Special Digest 1. Concrete in Aggressive Ground. Building Research Establishment.
- 2 BS 5930:1999. Code of practice for site investigations. British Standards Institution. London.
- 3 BS 8485. 2015. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. British Standards Institution. London.
- 4 BS 8576. 2013. Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOC). British Standards Institution. London.
- 5 BS 10175: 2001. Investigation of potentially contaminated sites - code of practice. British Standards Institution, London.
- 6 BS 3882:2015. Specification for topsoil and requirements for use. British Standards Institution. London.
- 7 BS 8601:2013. Specification for subsoil and requirements for use. British Standards Institution. London
- 8 Card G, Wilson S, Mortimore S. 2012. A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17. CL:AIRE. London.
- 9 CL:AIRE and Chartered Institute of Environmental Health (CIEH). 2008. Guidance on Comparing Soil Contamination Data with a Critical Concentration. CL:AIRE / CIEH. London.
- 10 CL:AIRE. 2013. SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. CL:AIRE. London.
- 11 CIRIA C665. 2007. Assessing Risks Posed by Hazardous Ground Gases to Buildings. CIRIA. London.
- 12 DEFRA. 2014. SP1010 - Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document. DEFRA. London.
- 13 Environment Agency. 2005. The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils. P5-080/TR3.
- 14 Environment Agency. 2006. Remedial Targets Methodology. Hydrogeological Risk Assessment for Land Contamination.
- 15 Environment Agency. 2008. Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values. Science Report SC050021/SR7.

- 16 Environment Agency. 2009. Human Health Toxicological Assessment of Contaminants in Soil. Science Report SC050021/SR2. Bristol.
- 17 Environment Agency. 2009. Updated technical background to the CLEA model. Science Report SC050021/SR3. Bristol.
- 18 Environment Agency. 2009. CLEA Software (Version 1.06) - Science Report SC050021/SR4. Bristol.
- 19 Environment Agency. 2010. Waste acceptance at landfills – Guidance on waste acceptance procedures and criteria. Bristol.
- 20 Environment Agency. 2013. Chemical Standards Database - <http://evidence.environment-agency.gov.uk/ChemicalStandards/ChemicalsByName.aspx>
- 21 Environment Agency. 2015. Waste Classification: Guidance on the classification and assessment of waste. First Edition. Technical Guidance WM3. Bristol.
- 22 Environment Agency. 2019. Land Contamination: Risk Management. UK Government Website - <https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks>.
- 23 Land Quality Management & Chartered Institute of Environmental Health (2015). The LQM/CIEH S4UL for Human Health Risk Assessment - LQM CIEH. Land Quality Press, Nottingham.
- 24 TPH Criteria Working Group: 1997: Total Petroleum Hydrocarbon Group Series. Volume 3. Selection of Representative TPH Fractions Based on Fate and Transport Considerations.
- 25 Wilson S, Card G and Haines S.2008. Ground Gas Handbook. Dunbeath. Whittles Publishing.
- 26 Yorkshire and Humberside Pollution Advisory Council. Version 3.1 October 2014. Verification Requirements for Cover Systems. Technical Guidance for Developers, Landowners and Consultants.

Figures / Drawings



Figure 1

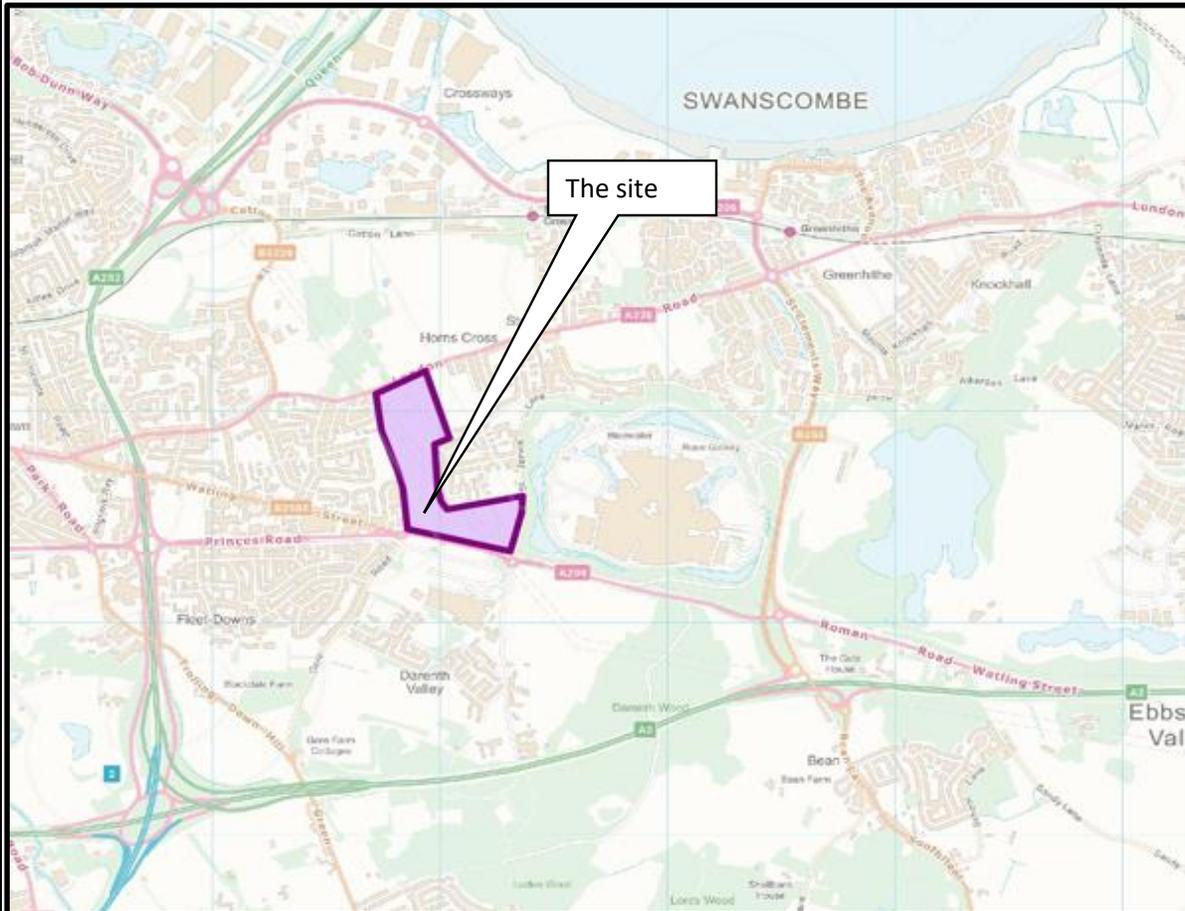
Site Location Plan

Project:

Stone Pit

Project No:

M44049



Reproduced from Ordnance Survey with the permission of the National Mapping Agency of Great Britain.
Crown Copyright Reserved Licence No. AL813427

general notes:
do not scale from the drawing, all dimensions shall be checked on site prior to commencing works.
all works shall conform to the current edition of the building regulations and other relevant statutory requirements.
all materials and workmanship shall conform with the relevant british standard specifications and codes of practice.
this drawing is the copyright of gdm architects and shall not be copied or reproduced without permission.
this drawing shall be read in conjunction with gdm architect's health and safety risk assessments and all works shall be carried out in a safe manner, by competent persons.
drawing produced by gdm architects ltd trading as gdm architects.

revision: details: by: date: by: xx.xx.xx



PHASE 1

PHASE 1

PHASE 2

PHASE 3

PHASE 2

PHASE 3

gdmarchitects

the master's house, college road, maidstone, kent ME15 6YF
t: 01622 760670 e: info@gdmarchitects.co.uk w: gdmarchitects.co.uk

client: Taylor Wimpey, South East

project: Stonepit 2, Dartford

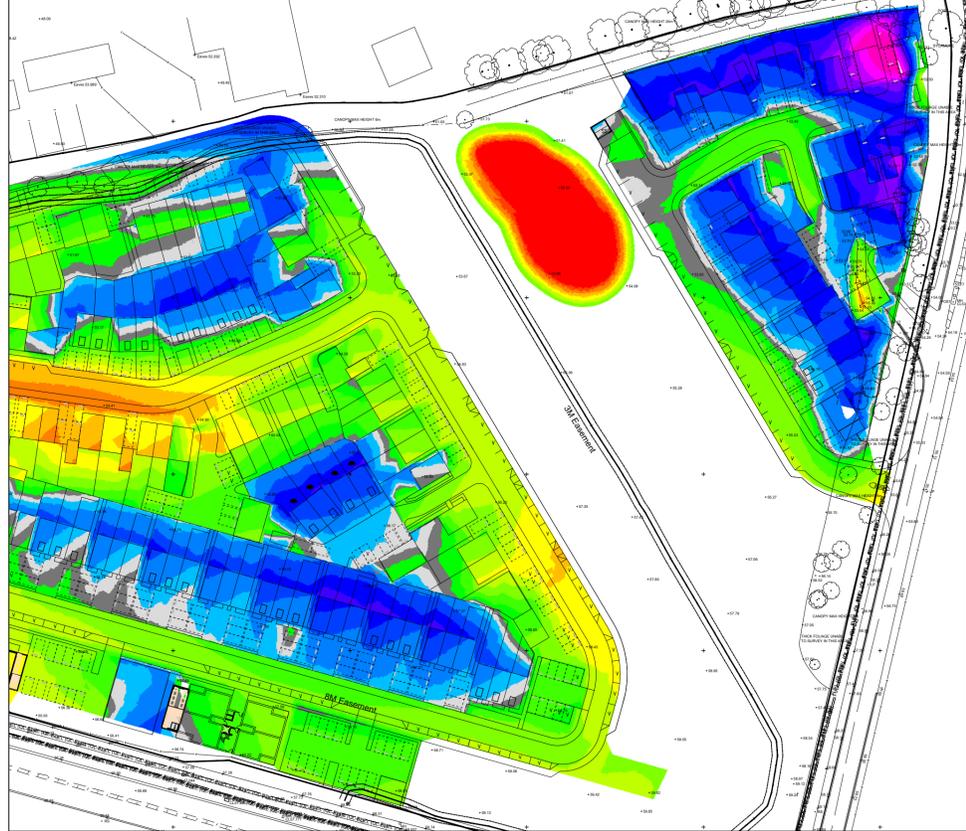
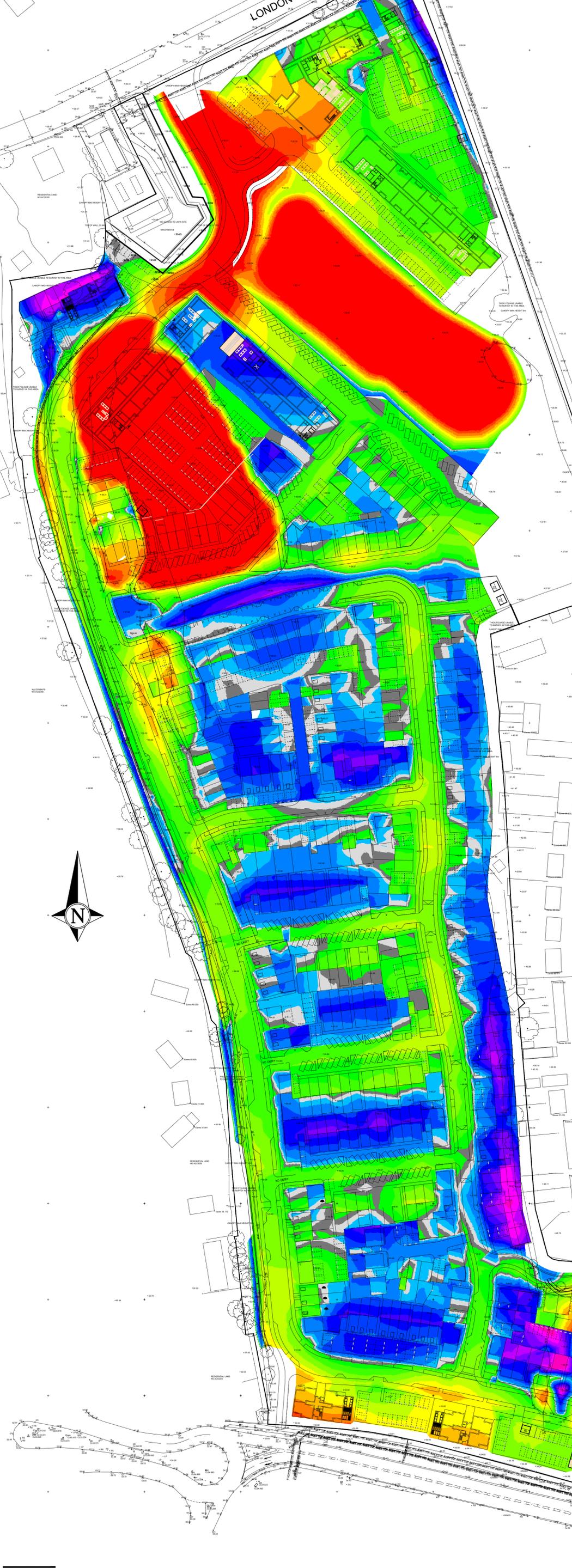
title: Site wide plan

date: Jan 23 drawn by: BM3

scale: 1/1250 checked: KM

PRELIMINARY

project number	drawing number	revision
21968	SP-010	A



STAGE 1 VOLUMETRIC

EXISTING AGAINST PROPOSED FORMATION LEVELS PRESENTED GRAPHICALLY

COMPARISON OF EXISTING DGM TO PROPOSED FORMATION LEVEL

CONSTRUCTION DEPTH USED FOR PROPOSED FORMATION MODEL

- PARKING SPACES = 600mm
- GARDENS = 150mm
- ROADS = 950mm
- APARTMENTS = 900mm
- APARTMENTS WITH SPECIALISED FOUNDATIONS = 1500mm
- APARTMENTS WITH PILED FOUNDATIONS = 1500mm
- HOUSES WITH RAFT FOUNDATION = 600mm
- HOUSES WITH SPECIALISED FOUNDATION = 1200mm
- HOUSES WITH PILED FOUNDATION = 1200mm
- BASINS = 500mm

122,757m³ CUT & 28558m³ FILL

THEREFORE NET = CUT (+10% BULKING) - FILL = 106,475m³ EXCESS MATERIAL

CUT Depth Bands		
Band 1	-0.00	-0.10
Band 2	-0.10	-0.25
Band 3	-0.25	-0.50
Band 4	-0.50	-0.75
Band 5	-0.75	-1.00
Band 6	-1.00	-1.25
Band 7	-1.25	-1.50
Band 8	-1.50	-1.75
Band 9	-1.75	-2.00
Band 10	-2.00	-

FILL Depth Bands		
Band 1	0.00	0.10
Band 2	0.10	0.25
Band 3	0.25	0.50
Band 4	0.50	0.75
Band 5	0.75	1.00
Band 6	1.00	1.25
Band 7	1.25	1.50
Band 8	1.50	1.75
Band 9	1.75	2.00
Band 10	2.00	-

NOTE: THE ABOVE FIGURES DO NOT INCLUDE ANY ALLOWANCE FOR SITE STRIP, AND ARE BASED ON 150MM TOPSOIL DEPTH IN GARDENS AND POS, THERE IS NO ALLOWANCE FOR ANY REQUIREMENT FOR CLEAN COVER AT THIS MOMENT IN TIME. IT IS ASSUMED THAT ALL AS-DUG MATERIAL IS SUITABLE FOR REUSE AS ENGINEERED FILL.

ESTIMATION OF CONSTRUCTION ARISING

- HOUSE, APARTMENT BLOCKS AND GARAGE FOUNDATIONS - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS
- HIGHWAYS - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS
- PARKING AREAS & DRIVEWAYS - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS
- FOOTWAYS - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS
- RETAINING WALLS - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS
- GARDENS AND POS - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS

DRAINAGE

- (FIGURES INC 10% BULKING AND WORKING WIDTHS)
- BASINS - VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS
- ATTENUATION TANKS - 6600m³
- FOUL WATER RUNS - 3700m³
- SURFACE WATER RUNS - 9000m³
- MANHOLES - 3000m³

UTILITIES

- DUE TO THE DEPTH AND WIDTH OF THE ROAD BOX THE SERVICES WILL BE WITHIN THE HIGHWAY FOUNDATION - THE VOLUME OF ARISING IS INCLUDED IN THE CUT AND FILL CALCULATIONS

NOTES

THE EARTHWORKS VOLUMES QUOTED ARE INDICATIVELY ONLY, CONTRACTORS ARE TO SATISFY THEMSELVES THAT APPROPRIATE ALLOWANCES HAVE BEEN MADE, PARTICULARLY REGARDING EXCAVATIONS AND ARISING. NO ALLOWANCE HAS BEEN MADE FOR ANY EFFECTS OF EARTHWORKS MANAGEMENT \ TEMPORARY STORAGE ETC, AND UNSUITABLE EARTHWORKS MATERIALS THAT MAY BE ENCOUNTERED. VOLUMETRICS HAVE BEEN BASED ON THE TOPOGRAPHICAL SURVEY CARRIED OUT BY ANGLIAN LAND SURVEYS MARCH 2022. ALTHOUGH ENDEAVOURS HAVE BEEN UNDERTAKEN TO PRODUCE THIS DRAWING AS ACCURATELY AS REASONABLY POSSIBLE IT SHOULD BE NOTED REUBY AND STAGG LTD TAKE NO RESPONSIBILITY FOR THE ACTUAL EARTHWORKS VOLUMES THAT MAY ARISE DURING THE COURSE OF THE WORKS AND UPON COMPLETION, DUE TO THE INHERENT UNCERTAINTIES.

P2	CONSTRUCTION ARISING NOTES ADDED	14/09/22 PN
P1	FIRST ISSUE	12/09/22 PN
Rev.	Description	Date

Drawing Status: **PLANNING**



Site: STONE PIT
Address: DARTFORD

Drig Title: EARTHWORKS

Scale: 1:1000	Page Size: A1	Date: SEP 22
Drawn: PN	Checked: MD	

Drawing No: 21968-500 Revision: P2

Appendix A Limitations



1 INTRODUCTION

- 1.1.1 This report is confidential and has been prepared solely for the benefit of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from JNP Group; a charge may be levied against such approval. JNP Group accepts no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned, and: this document to any third party with whom an agreement has not been executed.
- 1.1.2 Any comments given within this report are based on the understanding that the proposed works to be undertaken will be as described in the introduction and the information referred to and provided by others and will be assumed to be correct and will not have been checked by JNP Group and JNP Group will not accept any liability or responsibility for any inaccuracy in such information.
- 1.1.3 Any deviation from the recommendations or conclusions contained in this report should be referred to JNP Group in writing for comment and JNP Group reserve the right to reconsider their recommendations and conclusions contained within. JNP Group will not accept any liability or responsibility for any changes or deviations from the recommendations noted in this report without prior consultation and our full approval.
- 1.1.4 The details contained within this report reflect the site conditions prevailing at the time of investigation. JNP Group warrants the accuracy of this report up to and including that date. Additional information, improved practice or changes in legislation may necessitate this report having to be reviewed in whole or in part after that date. If necessary, this report should be referred back to JNP Group for re-assessment and, if necessary, re-appraisal.
- 1.1.5 This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report. Whilst this report and the opinion made herein are correct to the best of JNP Groups' belief, JNP Group cannot guarantee the accuracy or completeness of any information provided by third parties.
- 1.1.6 The report represents the finding and opinions of experience geotechnical and geo-environmental engineers. JNP Group does not provide legal advice and the advice of lawyers may also be required.
- 1.1.7 It should be noted that the following were not included as part of the agreed scope of works with the client: detailed ecological surveys and assessment.
- 1.1.8 JNP Group has provided advice and made recommendations based on the findings of the work undertaken, however this is subject to the approval / acceptance by the relevant regulatory authorities.

1.2 Objectives

- 1.2.1 The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be

considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, JNP Group reserves the right to review such information and, if warranted, to modify the opinions accordingly. It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

1.3 Phase II Intrusive Investigations

- 1.3.1 The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made.
- 1.3.2 Where intrusive investigations have been undertaken they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature sampling, no investigation technique is capable of identifying all conditions present in all areas. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered. The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.
- 1.3.3 The objectives of the investigation have been linked to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and ground water. The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to areas unoccupied by the building(s) on the site and by buried services.
- 1.3.4 Gas and groundwater levels may vary from those reported due to seasonal, or other effects.
- 1.3.5 It should also be noted that the assessment of soil results has been undertaken using data from a previous consultant; some of the gas monitoring and groundwater samples have been collected using existing monitoring wells not constructed by JNP Group.

1.4 Gas Membranes

- 1.4.1 Where JNP Group are commissioned to undertake the inspection and validation of a gas membrane, we, at the time of inspection, will ensure that the membrane is laid in accordance with the relevant arrangements and sections. At that time we will ensure that the venting media is laid correctly in preparation of the membrane and we will ensure that any tears in the membrane or bad workmanship is reported and instructions given to be rectified. Thereafter it is the duty of the Principal Contractor to ensure that tears and defects are rectified.

1.5 Remediation and Verification Reports Limitations

- 1.5.1 The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

- 1.5.2 Where intrusive investigations have been undertaken they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature sampling, no investigation technique is capable of identifying all conditions present in all areas. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered.
- 1.5.3 If costs have been included in relation to the site remediation these must be confirmed by a qualified quantity surveyor. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed from Third Party should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, JNP Group reserves the right to review such information and, if warranted, to modify the opinions accordingly.
- 1.5.4 Whilst this report and the opinion made herein are correct to the best of JNP Groups’ belief, JNP Group cannot guarantee the accuracy or completeness of any information provided by third parties.
- 1.5.5 It should also be noted that the assessment of soil results has been undertaken using data from a previous consultant; some of the gas monitoring and groundwater samples have been collected using existing monitoring wells not constructed by JNP Group.
- 1.5.6 Gas and groundwater levels may vary from those reported due to seasonal, or other effects.

Appendix B Hazardous Waste Assessment



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



FMSXQ-CJRIM-NE89C

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

Stone Pit, Dartford

Description/Comments

Maximum soil concentrations have been entered from the top 3m JNP Group data set.

Project

M44049

Site

Stone Pit, St James Lane

Classified by

Name:
Hilary Ilsley
Date:
20 Dec 2022 11:04 GMT
Telephone:
01926 889955

Company:
JNP Group
Mitaka House
4-12 Morton Street
Leamington Spa
CV32 5SY

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course
Hazardous Waste Classification

Date

Purpose of classification

7 - Disposal of Waste

Address of the waste

Stone Pit 2, St James Lane, Greenhithe, Kent

Post Code DA9 9DT

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

Site redevelopment for residential end use with associated infrastructure

Description of the specific process, sub-process and/or activity that created the waste

Excavation of soil contamination hot spots.

Description of the waste

The made ground consists of brown to dark grey sandy gravel and clays. The proportion of clay, sand and gravel varies, with the majority of the material encountered being cohesive. The gravel fraction comprises variable content of flint, brick, concrete, coal, chalk, quartzite and various deleterious materials.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	Site Maximums Top 3m		Potentially Hazardous	HP 3(i)	3

Related documents

#	Name	Description
1	JNP Updated 2022 Standard	waste stream template used to create this Job

Report

Created by: Hilary Ilesley

Created date: 20 Dec 2022 11:04 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	5
Appendix B: Rationale for selection of metal species	6
Appendix C: Version	7

Classification of sample: Site Maximums Top 3m

*** Potentially Hazardous Waste**
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name: Site Maximums Top 3m	LoW Code: Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: 12% (no correction)	Entry: 17 05 04 or 17 05 03 * (Soil and stones other than those mentioned in 17 05 03 or Soil and stones containing hazardous substances)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.06%)

Determinands

Moisture content: **12%** No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic pentoxide }				22	mg/kg	1.534	33.745	mg/kg	0.00337 %		
	033-004-00-6	215-116-9	1303-28-2									
2	barium { barium oxide }						1.117					
		215-127-9	1304-28-5									
3	beryllium { beryllium oxide }						2.775					
	004-003-00-8	215-133-1	1304-56-9									
4	boron { diboron trioxide; boric oxide }				9.6	mg/kg	3.22	30.911	mg/kg	0.00309 %		
	005-008-00-8	215-125-8	1303-86-2									
5	cadmium { cadmium oxide }				3.1	mg/kg	1.142	3.541	mg/kg	0.000354 %		
	048-002-00-0	215-146-2	1306-19-0									
6	chromium in chromium(III) compounds { chromium(III) oxide }				110	mg/kg	1.462	160.771	mg/kg	0.0161 %		
		215-160-9	1308-38-9									
7	copper { copper(II) oxide }				190	mg/kg	1.252	237.838	mg/kg	0.0238 %		
	029-016-00-6	215-269-1	1317-38-0									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	770	mg/kg		770	mg/kg	0.077 %		
	082-001-00-6											
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	4.4	mg/kg		4.4	mg/kg	0.00044 %		
	080-002-00-6											
10	nickel { nickel sulfate }				60	mg/kg	2.637	158.201	mg/kg	0.0158 %		
	028-009-00-5	232-104-9	7786-81-4									
11	potassium { potassium }											
	019-001-00-2	231-119-8	7440-09-7									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				8.3 mg/kg	1.405	11.662 mg/kg	0.00117 %		
	034-002-00-8									
13	vanadium { divanadium pentaoxide; vanadium pentoxide }				100 mg/kg	1.785	178.518 mg/kg	0.0179 %		
	023-001-00-8	215-239-8	1314-62-1							
14	zinc { zinc sulphate (hydrus) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				420 mg/kg	4.398	1847.129 mg/kg	0.185 %		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
15	naphthalene				1.3 mg/kg		1.3 mg/kg	0.00013 %		
	601-052-00-2	202-049-5	91-20-3							
16	acenaphthylene				0.85 mg/kg		0.85 mg/kg	0.000085 %		
		205-917-1	208-96-8							
17	acenaphthene				1.3 mg/kg		1.3 mg/kg	0.00013 %		
		201-469-6	83-32-9							
18	fluorene				0.84 mg/kg		0.84 mg/kg	0.000084 %		
		201-695-5	86-73-7							
19	phenanthrene				15 mg/kg		15 mg/kg	0.0015 %		
		201-581-5	85-01-8							
20	anthracene				2.8 mg/kg		2.8 mg/kg	0.00028 %		
		204-371-1	120-12-7							
21	fluoranthene				17 mg/kg		17 mg/kg	0.0017 %		
		205-912-4	206-44-0							
22	pyrene				14 mg/kg		14 mg/kg	0.0014 %		
		204-927-3	129-00-0							
23	benz[a]anthracene				6.7 mg/kg		6.7 mg/kg	0.00067 %		
	601-033-00-9	200-280-6	56-55-3							
24	chrysene				5.1 mg/kg		5.1 mg/kg	0.00051 %		
	601-048-00-0	205-923-4	218-01-9							
25	benzo[b]fluoranthene				7.3 mg/kg		7.3 mg/kg	0.00073 %		
	601-034-00-4	205-911-9	205-99-2							
26	benzo[k]fluoranthene				2.4 mg/kg		2.4 mg/kg	0.00024 %		
	601-036-00-5	205-916-6	207-08-9							
27	benzo[a]pyrene; benzo[def]chrysene				6.9 mg/kg		6.9 mg/kg	0.00069 %		
	601-032-00-3	200-028-5	50-32-8							
28	dibenz[a,h]anthracene				0.6 mg/kg		0.6 mg/kg	0.00006 %		
	601-041-00-2	200-181-8	53-70-3							
29	benzo[ghi]perylene				3.5 mg/kg		3.5 mg/kg	0.00035 %		
		205-883-8	191-24-2							
30	indeno[123-cd]pyrene				4.6 mg/kg		4.6 mg/kg	0.00046 %		
		205-893-2	193-39-5							
31	TPH (C6 to C40) petroleum group				600 mg/kg		600 mg/kg	0.06 %		
			TPH							
32	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
Total:								0.413 %		

Key

- User supplied data
 - Potentially Hazardous result
 - Determinand defined or amended by HazWasteOnline (see Appendix A)
 - Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- CLP: Note 1 Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

• **barium oxide** (EC Number: 215-127-9, CAS Number: 1304-28-5)

Description/Comments: Data from ECHA's C&L Inventory Database, Sigma Aldrich SDS dated 6/2/20
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/88825>
Data source date: 02 Apr 2020
Hazard Statements: Acute Tox. 3; H301, Skin Corr. 1B; H314, Eye Dam. 1; H318, Acute Tox. 1; H332

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

Description/Comments: Data from ECHA's C&L inventory database
Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>
Data source date: 30 Apr 2020
Hazard Statements: Acute Tox. 4; H302, Skin Sens. 1; H317, Eye Irrit. 2; H319

• **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

GB MCL index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

• **potassium** (EC Number: 231-119-8, CAS Number: 7440-09-7)

GB MCL index number: 019-001-00-2
Description/Comments:
Additional Hazard Statement(s): Water-react. 1; H260 >= 0.4 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - Water-react. 1; H260 >= 0.4 % hazard statement sourced from: WM3, Table C3.2

• **divanadium pentoxide; vanadium pentoxide** (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8
Description/Comments:
Additional Hazard Statement(s): Carc. 1B; H350, Acute Tox. 3; H301, Acute Tox. 2; H330
Reason for additional Hazards Statement(s):
20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

• **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic pentoxide}

Likely to be present as an oxide.

barium {barium oxide}

Likely to be present as an oxide

beryllium {beryllium oxide}

Likely to be present as an oxide

boron {diboron trioxide; boric oxide}

likely to be present as an oxide

cadmium {cadmium oxide}

more likely to be present as an oxide

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

likely to be present on site

copper {copper(II) oxide}

more likely to be present as an oxide

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromate unlikely to be found on site

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Likely to be present as inorganic mercury

nickel {nickel sulfate}

more likely to be present as a sulphate

potassium {potassium}

not tested

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

generic species selected as more appropriate

vanadium {divanadium pentaoxide; vanadium pentoxide}

no other choice

zinc {zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]}

Chromate unlikely to be on site

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2022.325.5408.10064 (21 Nov 2022)

HazWasteOnline Database: 2022.325.5408.10064 (21 Nov 2022)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

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

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

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

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

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

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

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

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

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

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

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

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

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

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

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

Appendix C WAC Testing Results





Final Report

Report No.: 22-33669-1

Initial Date of Issue: 14-Sep-2022

Client: JNP Group Consulting Engineers

Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ

Contact(s): Charles Wake
Hilary Ilsley

Project: M44049 Stone Pit, Dartford

Quotation No.: Q22-28580	Date Received: 05-Sep-2022
Order No.: G1693	Date Instructed: 05-Sep-2022
No. of Samples: 2	
Turnaround (Wkdays): 7	Results Due: 13-Sep-2022
Date Approved: 14-Sep-2022	

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-33669 Chemtest Sample ID: 1499644 Sample Ref: ES2 Sample ID: DSJ17 Sample Location: Stone Pit Top Depth(m): 0.7 Bottom Depth(m): Sampling Date: 30-Aug-2022										Landfill Waste Acceptance Criteria Limits		
							Inert Waste Landfill	Stable, Non- reactive hazardous waste in non- hazardous Landfill	Hazardous Waste Landfill			
Determinand	SOP	Accred.	Units									
Total Organic Carbon	2625	M	%				0.61	3	5	6		
Loss On Ignition	2610	M	%				3.2	--	--	10		
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--		
TPH Total WAC	2670	M	mg/kg				130	500	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				13	100	--	--		
pH	2010	M					9.5	--	>6	--		
Acid Neutralisation Capacity	2015	N	mol/kg				0.0050	--	To evaluate	To evaluate		
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg					
Arsenic	1455	U	0.0053	0.0065	0.011	0.063	0.5	2	25			
Barium	1455	U	0.052	0.016	0.10	0.22	20	100	300			
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5			
Chromium	1455	U	0.0017	0.0013	0.0034	0.014	0.5	10	70			
Copper	1455	U	0.012	0.0060	0.023	0.017	2	50	100			
Mercury	1455	U	0.00005	< 0.00005	0.00010	0.00008	0.01	0.2	2			
Molybdenum	1455	U	0.014	0.0050	0.027	0.063	0.5	10	30			
Nickel	1455	U	0.0025	0.0013	0.0050	0.015	0.4	10	40			
Lead	1455	U	< 0.0005	0.0042	< 0.0005	0.036	0.5	10	50			
Antimony	1455	U	0.010	0.0047	0.021	0.056	0.06	0.7	5			
Selenium	1455	U	0.0024	0.0016	0.0048	0.017	0.1	0.5	7			
Zinc	1455	U	< 0.003	0.005	< 0.003	0.045	4	50	200			
Chloride	1220	U	6.3	1.1	13	19	800	15000	25000			
Fluoride	1220	U	0.32	0.31	< 1.0	3.1	10	150	500			
Sulphate	1220	U	< 1.0	110	< 10	890	1000	20000	50000			
Total Dissolved Solids	1020	N	870	210	1700	3100	4000	60000	100000			
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-			
Dissolved Organic Carbon	1610	U	22	16	< 50	170	500	800	1000			

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.3

Leachate Test Information	
Leachant volume 1st extract/l	0.332
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.262

Waste Acceptance Criteria

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

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-33669							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1499645							Limits			
Sample Ref: ES3							Inert Waste Landfill	Stable, Non- reactive hazardous waste in non- hazardous Landfill	Hazardous Waste Landfill	
Sample ID: DSJ20										
Sample Location: Stone Pit										
Top Depth(m): 3.0										
Bottom Depth(m):										
Sampling Date: 30-Aug-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.93	3	5	6
Loss On Ignition	2610	M	%				3.7	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				14	100	--	--
pH	2010	M					9.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.0050	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0040	0.0043	0.0080	0.043	0.5	2	25	
Barium	1455	U	0.044	0.017	0.087	0.20	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	0.0006	< 0.0005	0.0050	0.5	10	70	
Copper	1455	U	0.012	0.0061	0.024	0.014	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.023	0.0069	0.045	0.088	0.5	10	30	
Nickel	1455	U	0.0043	0.0016	0.0085	0.019	0.4	10	40	
Lead	1455	U	0.0005	0.0012	0.0010	0.011	0.5	10	50	
Antimony	1455	U	0.0055	0.0039	0.011	0.041	0.06	0.7	5	
Selenium	1455	U	0.0050	0.0024	0.0099	0.027	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	91	15	180	240	800	15000	25000	
Fluoride	1220	U	1.0	1.0	2.0	10	10	150	500	
Sulphate	1220	U	< 1.0	94	< 10	830	1000	20000	50000	
Total Dissolved Solids	1020	N	760	250	1500	3100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	39	19	77	210	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	14

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.206

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-33848							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1500413							Limits			
Sample Ref: DSJ04							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES1										
Sample Location: Stone Pit										
Top Depth(m): 0.3										
Bottom Depth(m):										
Sampling Date: 01-Sep-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.3	3	5	6
Loss On Ignition	2610	M	%				4.1	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				91	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.014	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0029	0.0038	0.0058	0.037	0.5	2	25	
Barium	1455	U	0.044	0.016	0.088	0.21	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0015	0.0010	0.0031	0.011	0.5	10	70	
Copper	1455	U	0.011	0.0053	0.021	0.016	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0072	0.0027	0.015	0.034	0.5	10	30	
Nickel	1455	U	0.0024	0.0013	0.0049	0.015	0.4	10	40	
Lead	1455	U	< 0.0005	0.0021	< 0.0005	0.018	0.5	10	50	
Antimony	1455	U	0.011	0.0063	0.021	0.069	0.06	0.7	5	
Selenium	1455	U	0.0034	0.0017	0.0068	0.019	0.1	0.5	7	
Zinc	1455	U	0.005	0.005	0.010	0.046	4	50	200	
Chloride	1220	U	9.6	1.3	19	26	800	15000	25000	
Fluoride	1220	U	0.27	0.26	< 1.0	2.6	10	150	500	
Sulphate	1220	U	560	76	1100	1500	1000	20000	50000	
Total Dissolved Solids	1020	N	950	200	1900	3100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	28	16	56	180	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	6.5

Leachate Test Information	
Leachant volume 1st extract/l	0.338
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.269

Waste Acceptance Criteria

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

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-33848							Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1500414							Limits		
Sample Ref: DSJ08							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID: ES1									
Sample Location: Stone Pit									
Top Depth(m): 0.5									
Bottom Depth(m):									
Sampling Date: 01-Sep-2022									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	M	%	0.83			3	5	6
Loss On Ignition	2610	M	%	2.8			--	--	10
Total BTEX	2760	M	mg/kg	< 0.010			6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10			1	--	--
TPH Total WAC	2670	M	mg/kg	43			500	--	--
Total (Of 17) PAH's	2700	N	mg/kg	< 2.0			100	--	--
pH	2010	M		9.3			--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.025			--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0044	0.0071	0.0087	0.069	0.5	2	25
Barium	1455	U	0.028	0.013	0.055	0.14	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0011	< 0.0005	0.0099	0.5	10	70
Copper	1455	U	0.0053	0.0037	0.011	0.0044	2	50	100
Mercury	1455	U	0.00007	< 0.00005	0.00014	0.00006	0.01	0.2	2
Molybdenum	1455	U	0.011	0.0031	0.022	0.037	0.5	10	30
Nickel	1455	U	0.0029	0.0023	0.0058	0.023	0.4	10	40
Lead	1455	U	< 0.0005	0.0027	< 0.0005	0.024	0.5	10	50
Antimony	1455	U	0.0035	0.0019	0.0071	0.020	0.06	0.7	5
Selenium	1455	U	0.0070	0.0032	0.014	0.036	0.1	0.5	7
Zinc	1455	U	0.003	0.004	0.005	0.041	4	50	200
Chloride	1220	U	14	1.7	28	27	800	15000	25000
Fluoride	1220	U	0.30	0.22	< 1.0	2.3	10	150	500
Sulphate	1220	U	150	44	300	530	1000	20000	50000
Total Dissolved Solids	1020	N	840	160	1700	2100	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	33	27	66	280	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.1

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.144

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-34602 Chemtest Sample ID: 1504055 Sample Ref: BHJ02 Sample ID: ES2 Sample Location: Stone Pit Top Depth(m): 1.0 Bottom Depth(m): Sampling Date: 07-Sep-2022										Landfill Waste Acceptance Criteria		
										Limits		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill						
Determinand	SOP	Accred.	Units				2.4	3	5	6		
Total Organic Carbon	2625	M	%				4.0	--	--	10		
Loss On Ignition	2610	M	%				< 0.010	6	--	--		
Total BTEX	2760	M	mg/kg				< 0.10	1	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				44	500	--	--		
TPH Total WAC	2670	M	mg/kg				8.2	100	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				9.6	--	>6	--		
pH	2010	M					< 0.0020	--	To evaluate	To evaluate		
Acid Neutralisation Capacity	2015	N	mol/kg									
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg				
Arsenic	1455	U	0.016	0.010	0.031	0.11	0.5	2	25			
Barium	1455	U	0.040	0.010	0.079	0.13	20	100	300			
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5			
Chromium	1455	U	0.0022	0.0012	0.0042	0.013	0.5	10	70			
Copper	1455	U	0.029	0.0091	0.056	0.036	2	50	100			
Mercury	1455	U	0.00007	< 0.00005	0.00014	0.00009	0.01	0.2	2			
Molybdenum	1455	U	0.040	0.0076	0.078	0.12	0.5	10	30			
Nickel	1455	U	0.011	0.0020	0.021	0.031	0.4	10	40			
Lead	1455	U	< 0.0005	0.0005	< 0.0005	0.0045	0.5	10	50			
Antimony	1455	U	0.0076	0.0072	0.015	0.072	0.06	0.7	5			
Selenium	1455	U	0.0064	0.0030	0.013	0.034	0.1	0.5	7			
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200			
Chloride	1220	U	53	7.7	100	130	800	15000	25000			
Fluoride	1220	U	0.20	0.29	< 1.0	2.8	10	150	500			
Sulphate	1220	U	620	110	1200	1700	1000	20000	50000			
Total Dissolved Solids	1020	N	680	280	1300	3300	4000	60000	100000			
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-			
Dissolved Organic Carbon	1610	U	26	14	51	150	500	800	1000			

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.312
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.219

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils (Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description (Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-37463 Chemtest Sample ID: 1516413 Sample Ref: BHJ06 Sample ID: ES12 Sample Location: Stone Pit Top Depth(m): 14.50 Bottom Depth(m): Sampling Date: 29-Sep-2022										Landfill Waste Acceptance Criteria		
										Limits		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill						
Determinand	SOP	Accred.	Units									
Total Organic Carbon	2625	M	%				1.4	3	5	6		
Loss On Ignition	2610	M	%				1.1	--	--	10		
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--		
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				11	100	--	--		
pH	2010	M					9.2	--	>6	--		
Acid Neutralisation Capacity	2015	N	mol/kg				0.018	--	To evaluate	To evaluate		
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg					
Arsenic	1455	U	0.0071	0.0095	0.014	0.091	0.5	2	25			
Barium	1455	U	0.013	0.005	0.025	0.062	20	100	300			
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5			
Chromium	1455	U	0.0048	0.0019	0.0093	0.023	0.5	10	70			
Copper	1455	U	0.0079	0.0063	0.016	0.011	2	50	100			
Mercury	1455	U	< 0.00005	0.00005	< 0.00005	0.00043	0.01	0.2	2			
Molybdenum	1455	U	0.020	0.0026	0.039	0.050	0.5	10	30			
Nickel	1455	U	0.0037	0.0013	0.0073	0.016	0.4	10	40			
Lead	1455	U	< 0.0005	0.0041	< 0.0005	0.035	0.5	10	50			
Antimony	1455	U	0.018	0.0065	0.035	0.081	0.06	0.7	5			
Selenium	1455	U	0.0036	0.0024	0.0070	0.025	0.1	0.5	7			
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200			
Chloride	1220	U	20	2.9	39	52	800	15000	25000			
Fluoride	1220	U	0.24	0.16	< 1.0	1.7	10	150	500			
Sulphate	1220	U	130	22	260	370	1000	20000	50000			
Total Dissolved Solids	1020	N	250	87	490	1100	4000	60000	100000			
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-			
Dissolved Organic Carbon	1610	U	8.3	4.3	< 50	< 50	500	800	1000			

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	19

Leachate Test Information	
Leachant volume 1st extract/l	0.308
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.241

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-37473-1

Initial Date of Issue: 12-Oct-2022

Client: JNP Group Consulting Engineers

Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ

Contact(s): Charles Wake
Hilary Ilsley

Project: M44049 Stone Pit, Dartford

Quotation No.: Q22-28580	Date Received: 02-Oct-2022
Order No.: G1693	Date Instructed: 02-Oct-2022
No. of Samples: 2	
Turnaround (Wkdays): 7	Results Due: 10-Oct-2022
Date Approved: 12-Oct-2022	

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-37473							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1516476							Limits			
Sample Ref: BHJ05							Inert Waste Landfill	Stable, Non- reactive hazardous waste in non- hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES5										
Sample Location: Stone Pit										
Top Depth(m): 4.50										
Bottom Depth(m):										
Sampling Date: 26-Sep-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				2.0	3	5	6
Loss On Ignition	2610	M	%				1.9	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				13	100	--	--
pH	2010	M					9.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.011	--	To evaluate	To evaluate
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0095	0.012	0.019	0.12	0.12	0.5	2	25
Barium	1455	U	0.017	0.008	0.033	0.093	0.093	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0011	< 0.0005	0.0096	0.0096	0.5	10	70
Copper	1455	U	0.0058	0.011	0.011	0.0081	0.0081	2	50	100
Mercury	1455	U	< 0.00005	0.00010	< 0.00005	0.00085	0.00085	0.01	0.2	2
Molybdenum	1455	U	0.015	0.0026	0.030	0.042	0.042	0.5	10	30
Nickel	1455	U	0.0027	0.0017	0.0053	0.019	0.019	0.4	10	40
Lead	1455	U	0.0014	0.0086	0.0027	0.077	0.077	0.5	10	50
Antimony	1455	U	0.016	0.0074	0.031	0.084	0.084	0.06	0.7	5
Selenium	1455	U	0.0050	0.0029	0.0097	0.032	0.032	0.1	0.5	7
Zinc	1455	U	< 0.003	0.004	< 0.003	0.035	0.035	4	50	200
Chloride	1220	U	22	2.1	43	46	46	800	15000	25000
Fluoride	1220	U	1.7	0.99	3.3	11	11	10	150	500
Sulphate	1220	U	180	27	350	460	460	1000	20000	50000
Total Dissolved Solids	1020	N	330	94	650	1200	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	11	4.8	< 50	56	56	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.311
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.221

Waste Acceptance Criteria

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

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-37473 Chemtest Sample ID: 1516477 Sample Ref: BHJ05 Sample ID: ES10 Sample Location: Stone Pit Top Depth(m): 11.50 Bottom Depth(m): Sampling Date: 26-Sep-2022										Landfill Waste Acceptance Criteria		
										Limits		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill						
Determinand	SOP	Accred.	Units									
Total Organic Carbon	2625	M	%				0.71	3	5	6		
Loss On Ignition	2610	M	%				2.5	--	--	10		
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--		
TPH Total WAC	2670	M	mg/kg				160	500	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				4.7	100	--	--		
pH	2010	M					9.4	--	>6	--		
Acid Neutralisation Capacity	2015	N	mol/kg				0.014	--	To evaluate	To evaluate		
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg				
Arsenic	1455	U	0.015	0.013	0.030	0.13	0.13	0.5	2	25		
Barium	1455	U	0.030	0.008	0.059	0.10	0.10	20	100	300		
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5		
Chromium	1455	U	0.0017	0.0015	0.0034	0.015	0.015	0.5	10	70		
Copper	1455	U	0.014	0.0091	0.028	0.013	0.013	2	50	100		
Mercury	1455	U	0.00013	< 0.00005	0.00026	0.00012	0.00012	0.01	0.2	2		
Molybdenum	1455	U	0.065	0.013	0.13	0.18	0.18	0.5	10	30		
Nickel	1455	U	0.0070	0.0027	0.014	0.030	0.030	0.4	10	40		
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50		
Antimony	1455	U	0.010	0.0085	0.020	0.086	0.086	0.06	0.7	5		
Selenium	1455	U	0.0056	0.0035	0.011	0.037	0.037	0.1	0.5	7		
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200		
Chloride	1220	U	160	31	320	430	430	800	15000	25000		
Fluoride	1220	U	0.44	0.41	< 1.0	4.1	4.1	10	150	500		
Sulphate	1220	U	470	120	930	1600	1600	1000	20000	50000		
Total Dissolved Solids	1020	N	900	170	1800	2400	2400	4000	60000	100000		
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	< 0.50	1	-	-		
Dissolved Organic Carbon	1610	U	18	7.1	< 50	81	81	500	800	1000		

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.160

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-36512-1
Initial Date of Issue: 06-Oct-2022
Client: JNP Group Consulting Engineers
Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ
Contact(s): Charles Wake
Hilary Ilsley
Project: M44049 Stone Pit, Dartford
Quotation No.: Q22-28580
Date Received: 26-Sep-2022
Order No.: G1693
Date Instructed: 26-Sep-2022
No. of Samples: 1
Turnaround (Wkdays): 7
Results Due: 04-Oct-2022
Date Approved: 06-Oct-2022

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-36512							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1512321							Limits			
Sample Ref: BHJ08							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES3										
Sample Location: Stone Pit										
Top Depth(m): 3.00										
Bottom Depth(m):										
Sampling Date: 20-Sep-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.22	3	5	6
Loss On Ignition	2610	M	%				1.4	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				8.1	100	--	--
pH	2010	M					9.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.021	--	To evaluate	To evaluate
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.031	0.032	0.062	0.32	0.5	2	25	
Barium	1455	U	0.042	0.010	0.083	0.15	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0073	0.0023	0.014	0.030	0.5	10	70	
Copper	1455	U	0.015	0.0067	0.030	0.020	2	50	100	
Mercury	1455	U	0.00007	< 0.00005	0.00014	0.00009	0.01	0.2	2	
Molybdenum	1455	U	0.031	0.0047	0.061	0.081	0.5	10	30	
Nickel	1455	U	0.0035	0.0010	0.0070	0.014	0.4	10	40	
Lead	1455	U	< 0.0005	0.0019	< 0.0005	0.017	0.5	10	50	
Antimony	1455	U	0.025	0.014	0.050	0.15	0.06	0.7	5	
Selenium	1455	U	0.0051	0.0035	0.010	0.037	0.1	0.5	7	
Zinc	1455	U	0.004	< 0.003	0.008	0.005	4	50	200	
Chloride	1220	U	25	1.5	49	46	800	15000	25000	
Fluoride	1220	U	0.41	0.32	< 1.0	3.3	10	150	500	
Sulphate	1220	U	580	91	1100	1600	1000	20000	50000	
Total Dissolved Solids	1020	N	710	170	1400	2400	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	12	4.3	< 50	53	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.318
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.230

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-36987-1
Initial Date of Issue: 10-Oct-2022
Client: JNP Group Consulting Engineers
Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ
Contact(s): Charles Wake
Hilary Ilsley
Project: M44049 Stone Pit, Dartford
Quotation No.: Q22-28580 **Date Received:** 28-Sep-2022
Order No.: G1693 **Date Instructed:** 28-Sep-2022
No. of Samples: 1
Turnaround (Wkdays): 7 **Results Due:** 06-Oct-2022
Date Approved: 10-Oct-2022

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-36987 Chemtest Sample ID: 1514246 Sample Ref: BHJ13 Sample ID: ES3 Sample Location: Stone Pit Top Depth(m): 3.00 Bottom Depth(m): Sampling Date: 15-Sep-2022										Landfill Waste Acceptance Criteria		
										Limits		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill						
Determinand	SOP	Accred.	Units									
Total Organic Carbon	2625	M	%				0.46	3	5	6		
Loss On Ignition	2610	M	%				3.2	--	--	10		
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--		
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--		
pH	2010	M					8.2	--	>6	--		
Acid Neutralisation Capacity	2015	N	mol/kg				0.024	--	To evaluate	To evaluate		
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg				
Arsenic	1455	U	0.0054	0.0085	0.011	0.080	0.5	2	25			
Barium	1455	U	0.044	0.013	0.086	0.17	20	100	300			
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5			
Chromium	1455	U	0.0008	0.0011	0.0015	0.010	0.5	10	70			
Copper	1455	U	0.015	0.0081	0.029	0.020	2	50	100			
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2			
Molybdenum	1455	U	0.017	0.0032	0.033	0.050	0.5	10	30			
Nickel	1455	U	0.0033	0.0016	0.0065	0.019	0.4	10	40			
Lead	1455	U	< 0.0005	0.0083	< 0.0005	0.072	0.5	10	50			
Antimony	1455	U	0.0068	0.0026	0.013	0.032	0.06	0.7	5			
Selenium	1455	U	0.0057	0.0026	0.011	0.030	0.1	0.5	7			
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200			
Chloride	1220	U	36	2.5	70	71	800	15000	25000			
Fluoride	1220	U	0.20	0.23	< 1.0	2.2	10	150	500			
Sulphate	1220	U	470	48	910	1100	1000	20000	50000			
Total Dissolved Solids	1020	N	630	120	1200	1900	4000	60000	100000			
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-			
Dissolved Organic Carbon	1610	U	19	4.9	< 50	68	500	800	1000			

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	19

Leachate Test Information	
Leachant volume 1st extract/l	0.309
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.240

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-38675-1
Initial Date of Issue: 18-Oct-2022
Client: JNP Group Consulting Engineers
Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ
Contact(s): Hilary Ilsley
Project: M44049 Stone Pit, Dartford
Quotation No.: Q22-28580 **Date Received:** 10-Oct-2022
Order No.: G1693 **Date Instructed:** 10-Oct-2022
No. of Samples: 3
Turnaround (Wkdays): 7 **Results Due:** 18-Oct-2022
Date Approved: 18-Oct-2022

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-38675							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1521974							Limits			
Sample Ref: BHJ16							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES3										
Sample Location: Stone Pit										
Top Depth(m): 5.00										
Bottom Depth(m):										
Sampling Date: 04-Oct-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.74	3	5	6
Loss On Ignition	2610	M	%				3.2	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				9.6	100	--	--
pH	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.034	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.017	0.015	0.033	0.15	0.5	2	25	
Barium	1455	U	0.078	0.015	0.15	0.23	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0020	0.0009	0.0039	0.010	0.5	10	70	
Copper	1455	U	0.019	0.016	0.038	0.024	2	50	100	
Mercury	1455	U	0.00005	0.00014	0.00011	0.0013	0.01	0.2	2	
Molybdenum	1455	U	0.045	0.0079	0.089	0.12	0.5	10	30	
Nickel	1455	U	0.0060	0.0023	0.012	0.027	0.4	10	40	
Lead	1455	U	0.0011	0.0043	0.0021	0.039	0.5	10	50	
Antimony	1455	U	0.026	0.016	0.051	0.17	0.06	0.7	5	
Selenium	1455	U	0.0060	0.0026	0.012	0.030	0.1	0.5	7	
Zinc	1455	U	0.007	0.007	0.014	0.072	4	50	200	
Chloride	1220	U	34	3.9	67	76	800	15000	25000	
Fluoride	1220	U	0.38	0.34	< 1.0	3.4	10	150	500	
Sulphate	1220	U	1000	140	2000	2400	1000	20000	50000	
Total Dissolved Solids	1020	N	1100	270	2100	3600	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	24	7.3	< 50	93	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.325
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.214

Waste Acceptance Criteria

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

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-38675 Chemtest Sample ID: 1521975 Sample Ref: BHJ16 Sample ID: ES11 Sample Location: Stone Pit Top Depth(m): 35.00 Bottom Depth(m): Sampling Date: 07-Oct-2022										Landfill Waste Acceptance Criteria Limits		
							Inert Waste Landfill	Stable, Non- reactive hazardous waste in non- hazardous Landfill	Hazardous Waste Landfill			
Determinand	SOP	Accred.	Units									
Total Organic Carbon	2625	M	%				< 0.20	3	5	6		
Loss On Ignition	2610	M	%				0.26	--	--	10		
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--		
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--		
pH	2010	M					8.5	--	>6	--		
Acid Neutralisation Capacity	2015	N	mol/kg				0.023	--	To evaluate	To evaluate		
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg				
Arsenic	1455	U	0.0021	0.0009	0.0042	0.011	0.5	2	25			
Barium	1455	U	0.031	0.007	0.061	0.098	20	100	300			
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5			
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70			
Copper	1455	U	0.0039	0.0013	0.0077	0.0040	2	50	100			
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2			
Molybdenum	1455	U	0.051	0.0091	0.10	0.13	0.5	10	30			
Nickel	1455	U	0.0094	0.0015	0.018	0.023	0.4	10	40			
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50			
Antimony	1455	U	0.0028	0.0008	0.0056	0.010	0.06	0.7	5			
Selenium	1455	U	0.0011	< 0.0005	0.0022	0.0011	0.1	0.5	7			
Zinc	1455	U	0.009	0.007	0.017	0.070	4	50	200			
Chloride	1220	U	39	5.2	76	86	800	15000	25000			
Fluoride	1220	U	0.21	0.14	< 1.0	1.5	10	150	500			
Sulphate	1220	U	140	25	270	370	1000	20000	50000			
Total Dissolved Solids	1020	N	340	85	660	1100	4000	60000	100000			
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-			
Dissolved Organic Carbon	1610	U	9.2	2.9	< 50	< 50	500	800	1000			

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.312
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.180

Waste Acceptance Criteria

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

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-38675							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1521976							Limits			
Sample Ref: Mound HDJ01							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES1										
Sample Location: Stone Pit										
Top Depth(m): 0.10										
Bottom Depth(m):										
Sampling Date: 07-Oct-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				0.73	3	5	6
Loss On Ignition	2610	M	%				3.1	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				12	100	--	--
pH	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.011	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0059	0.0076	0.012	0.075	0.5	2	25	
Barium	1455	U	0.021	0.011	0.043	0.12	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0018	0.0017	0.0035	0.017	0.5	10	70	
Copper	1455	U	0.013	0.0074	0.025	0.011	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.017	0.0046	0.033	0.056	0.5	10	30	
Nickel	1455	U	0.0025	0.0018	0.0050	0.018	0.4	10	40	
Lead	1455	U	< 0.0005	0.0049	< 0.0005	0.045	0.5	10	50	
Antimony	1455	U	0.0023	0.0016	0.0046	0.017	0.06	0.7	5	
Selenium	1455	U	0.0039	0.0031	0.0077	0.032	0.1	0.5	7	
Zinc	1455	U	0.010	0.024	0.019	0.23	4	50	200	
Chloride	1220	U	12	2.0	24	29	800	15000	25000	
Fluoride	1220	U	1.0	0.53	2.0	5.7	10	150	500	
Sulphate	1220	U	81	20	160	250	1000	20000	50000	
Total Dissolved Solids	1020	N	220	97	440	1100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	15	13	< 50	130	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.3

Leachate Test Information	
Leachant volume 1st extract/l	0.336
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.152

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-38528-1

Initial Date of Issue: 18-Oct-2022

Client: JNP Group Consulting Engineers

Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ

Contact(s): Charles Wake
Hilary Ilsley

Project: M44049 Stone Pit, Dartford

Quotation No.: Q22-28580	Date Received: 10-Oct-2022
Order No.: G1693	Date Instructed: 10-Oct-2022
No. of Samples: 1	
Turnaround (Wkdays): 7	Results Due: 18-Oct-2022
Date Approved: 18-Oct-2022	

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-38528							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1521382							Limits			
Sample Ref: BHJ17							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES7										
Sample Location: Stone Pit										
Top Depth(m): 7										
Bottom Depth(m):										
Sampling Date: 05-Oct-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.2	3	5	6
Loss On Ignition	2610	M	%				0.86	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.012	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0006	0.0003	0.0013	0.0034	0.5	2	25	
Barium	1455	U	0.013	< 0.005	0.026	0.018	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0014	0.0006	0.0027	0.0019	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0031	0.0009	0.0062	0.012	0.5	10	30	
Nickel	1455	U	0.0006	< 0.0005	0.0011	0.0008	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0015	< 0.0005	0.0029	0.0020	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	0.007	< 0.003	0.013	0.009	4	50	200	
Chloride	1220	U	8.5	< 1.0	17	12	800	15000	25000	
Fluoride	1220	U	0.23	0.15	< 1.0	1.6	10	150	500	
Sulphate	1220	U	51	5.4	100	120	1000	20000	50000	
Total Dissolved Solids	1020	N	160	55	320	700	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.4	4.2	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	6.2

Leachate Test Information	
Leachant volume 1st extract/l	0.338
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.245

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-32396-1

Initial Date of Issue: 05-Sep-2022

Client: JNP Group Consulting Engineers

Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ

Contact(s): Charles Wake
Hilary Ilsley

Project: M44049 Stone Pit, Dartford

Quotation No.: Q22-28580	Date Received: 24-Aug-2022
Order No.: G1693	Date Instructed: 24-Aug-2022
No. of Samples: 1	
Turnaround (Wkdays): 7	Results Due: 02-Sep-2022
Date Approved: 05-Sep-2022	

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-32396							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1493852							Limits			
Sample Ref: TPJ08							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: ES1										
Sample Location: Mound										
Top Depth(m): 1.00										
Bottom Depth(m):										
Sampling Date: 22-Aug-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.9	3	5	6
Loss On Ignition	2610	M	%				4.8	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				120	100	--	--
pH	2010	M					8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.013	--	To evaluate	To evaluate
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0058	0.011	0.011	0.012	0.10	0.5	2	25
Barium	1455	U	0.029	0.011	0.011	0.058	0.14	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	0.0010	< 0.0005	0.0081	0.0081	0.5	10	70
Copper	1455	U	0.0045	0.0050	0.0090	0.0079	0.0079	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0065	0.0024	0.013	0.031	0.031	0.5	10	30
Nickel	1455	U	0.0011	0.0010	0.0022	0.010	0.010	0.4	10	40
Lead	1455	U	< 0.0005	0.0065	< 0.0005	0.053	0.053	0.5	10	50
Antimony	1455	U	0.0054	0.0036	0.011	0.039	0.039	0.06	0.7	5
Selenium	1455	U	0.0030	0.0025	0.0060	0.026	0.026	0.1	0.5	7
Zinc	1455	U	< 0.003	0.003	< 0.003	0.024	0.024	4	50	200
Chloride	1220	U	7.0	1.3	14	23	23	800	15000	25000
Fluoride	1220	U	0.29	0.19	< 1.0	2.0	2.0	10	150	500
Sulphate	1220	U	210	35	410	650	650	1000	20000	50000
Total Dissolved Solids	1020	N	500	96	1000	1700	1700	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.0	8.9	< 50	84	84	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.5

Leachate Test Information	
Leachant volume 1st extract/l	0.332
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.305

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils (Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description (Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 22-32862-1

Initial Date of Issue: 06-Sep-2022

Client: JNP Group Consulting Engineers

Client Address: Portobello House
Portobello Way
Warwick
CV34 5GJ

Contact(s): Charles Wake
Hilary Ilsley

Project: M44049 Stone Pit, Dartford

Quotation No.: Q22-28580	Date Received: 26-Aug-2022
Order No.: G1693	Date Instructed: 26-Aug-2022
No. of Samples: 1	
Turnaround (Wkdays): 7	Results Due: 06-Sep-2022
Date Approved: 06-Sep-2022	

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

Chemtest Job No: 22-32862 Chemtest Sample ID: 1495799 Sample Ref: TPJ27 Sample ID: WAC Sample Location: Stone Pit Top Depth(m): 0.32 Bottom Depth(m): Sampling Date: 23-Aug-2022										Landfill Waste Acceptance Criteria		
										Limits		
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill						
Determinand	SOP	Accred.	Units				0.67	3	5	6		
Total Organic Carbon	2625	M	%				2.5	--	--	10		
Loss On Ignition	2610	M	%				< 0.010	6	--	--		
Total BTEX	2760	M	mg/kg				< 0.10	1	--	--		
Total PCBs (7 Congeners)	2815	M	mg/kg				< 10	500	--	--		
TPH Total WAC	2670	M	mg/kg				22	100	--	--		
Total (Of 17) PAH's	2700	N	mg/kg				9.6	--	>6	--		
pH	2010	M					0.014	--	To evaluate	To evaluate		
Acid Neutralisation Capacity	2015	N	mol/kg									
Eluate Analysis				2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg				
Arsenic	1455	U	0.0026	0.0070	0.0052	0.065	0.5	2	25			
Barium	1455	U	0.018	0.007	0.036	0.081	20	100	300			
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5			
Chromium	1455	U	0.0040	0.0037	0.0080	0.037	0.5	10	70			
Copper	1455	U	0.0049	0.0038	0.0097	0.0053	2	50	100			
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2			
Molybdenum	1455	U	0.027	0.0053	0.054	0.077	0.5	10	30			
Nickel	1455	U	0.0032	0.0023	0.0063	0.024	0.4	10	40			
Lead	1455	U	< 0.0005	0.0006	< 0.0005	0.0049	0.5	10	50			
Antimony	1455	U	0.0018	0.0022	0.0035	0.021	0.06	0.7	5			
Selenium	1455	U	0.0014	0.0025	0.0028	0.024	0.1	0.5	7			
Zinc	1455	U	0.003	0.003	0.005	0.033	4	50	200			
Chloride	1220	U	43	5.0	86	92	800	15000	25000			
Fluoride	1220	U	0.85	0.39	1.7	4.4	10	150	500			
Sulphate	1220	U	240	36	480	590	1000	20000	50000			
Total Dissolved Solids	1020	N	350	200	690	2200	4000	60000	100000			
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-			
Dissolved Organic Carbon	1610	U	14	12	< 50	120	500	800	1000			

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.7

Leachate Test Information	
Leachant volume 1st extract/l	0.331
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.192

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Appendix D Borehole Decommissioning



Appendix D TECHNICAL NOTE

Job name: Stone Pit, Dartford
Job No: M44049
Note No: Remediation Strategy Appendix D
Date: 21/12/2022
Prepared by: Hilary Ilsley
Subject: Borehole Decommissioning

Decommission Strategy

This strategy has been written in accordance with the Environment Agency guidance given in the following publications:

Section 5.5 of Guidance on the design and installation of groundwater quality monitoring points [EA 2006];

Good practise for decommissioning redundant boreholes and wells [EA 2012].

All existing former boreholes remaining from previous ground investigations and any monitoring boreholes are to be decommissioned to avoid leaving a potential pathway for contaminant migration, avoid vertical flows and prevent the mixing of contaminated and uncontaminated groundwater.

Step 1 Identification

During the initial surface strip work, an inspection shall be undertaken to identify any remaining boreholes and determine or verify the construction details, this will also include obtaining a measurement of the groundwater level (if the borehole is accessible).

Step 2 Removal

The following are options for decommissioning boreholes: complete removal, partially removed or sealing the installation to prevent it forming a preferential pathway. Given the extensive earthworks activities at the site, the most practicable option is the complete removal of the boreholes. This is also the preferred option of the EA, however, it is dependent upon the condition of the casing.

The borehole casing can be removed by pulling it out using hydraulic jacks or suitable alternative for shallow boreholes. The borehole should then be over drilled to removal any remaining installation materials.

For deeper boreholes, over drilling should be undertaken using a hollow stem auger which is 50-100 mm larger than the external casing diameter. The auger is placed over the casing so that the backfill material are drilled out, leaving the unsupported casing in the hollow stem from where it can be removed. The borehole is backfilled via the hollow stem as the auger is removed.

Step 3 Backfill

The boreholes should be backfilled in a way that mimics that natural conditions of the ground, given the presence of chalk at the site which may be fissured, the use of a grout seal is not suggested for use. The backfill material must be clean, inert and non-polluting. The use of either pea gravel or sand is recommended.

Appendix D TECHNICAL NOTE

Step 4 Sealing

The backfilled boreholes should be completed with an impermeable plug and cap to prevent entry of potentially contaminated surface run-off.

Step 5 Documentation

The borehole decommissioning process shall be fully documented to demonstrate that it has been undertaken and shall be incorporated as part of the Verification Report for the site.

Appendix E Waste License and Environmental Permit



Appendix F Waste Disposal Records



Appendix G Imported Soil Documentation



IMPORTED SOIL DOCUMENTATION FORM

Stockpile Identification Reference	
Material Type	
Source Site	
Consignment Note Reference Numbers	
Volume of Stockpile (Or number of loads)	
Plots Material to be Used In	

Signed.....

Position.....

Date.....

Appendix H Gas Protection Measures Validation



CHECKLIST FOR GAS VERIFICATION REPORTS

The Verification Report should include a summary of all the works undertaken, relating to gas protection measures including all elements detailed within the Remediation Strategy.

As a minimum, the report should include (but not limited to):

Site details;

Planning Application details;

Summary of Gas Risk Assessment (including original CSM);

Details of who carried out installation (qualifications/experience/training);

Description of protection measures installed with reference to method statements and drawings and manufacturers specification of the materials used;

Details of the verification inspection regime;

Supporting information, plans, air vent installation, photographs, as built drawings;

Summary of verification data (completed proformas, test results);

Details of non-conformances and how they were rectified;

Clear statement saying remedial objectives been achieved supported by lines of evidence including reference to CSM;

Where necessary, further works and/or long term management.

Verification Proforma

Copied Directly from Appendix A5 CIRIA C735

Mallett, H, Cox (nee Taffel-Andureau), L, Wilson, S, Corban, M (2014) Good Practice on the Testing and Verification of Protection Systems for Buildings Against Hazardous Ground Gases, CIRIA, C735, London (ISBN: 978-0-86017-739-5) Go to: www.ciria.org

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name:	Gas characteristic situation:
Job number:	Type of development and building/block checked: (residential commercial/other)
Date:	Building description:
Visit by:	Foundation type: (suspended floor/raft/other)
Weather at time of inspection:	Gas protection type: passive/active

1 Gas membrane		
1.1	Condition of sub-grade and underside of gas membrane	
1.2	Gas membrane type	
1.3	Gas membrane condition	
1.4	Joining tape product	
1.5	Lapping design	
1.6	Laps, welds and joints seals	
1.7	Service entries seals	
2 Passive venting		



2.1	Sub-floor void	
2.2	External wall airbricks	
2.3	Internal sleeper walls	
2.4	External vent trenches/ducts	
3 Active venting		
3.1	System details	
Additional notes:		

Notes: Inspection checklist

1.1	Underside of gas membrane	Check that the sub grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/specification? Minimum overlap insured? Sections taped twice.
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs

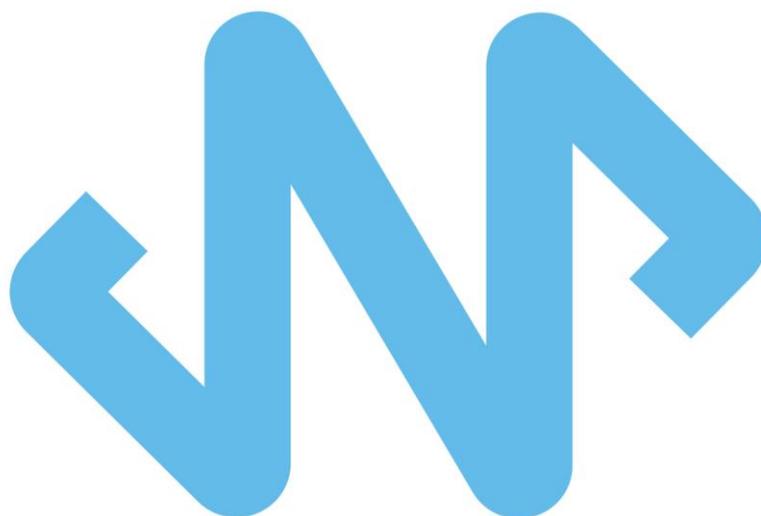
No.	Description

The gas protection measures inspected:	A Are acceptable and comply with the specification
	B Are acceptable but attention is drawn to issues related to item no. xxx
	C Are not acceptable due to the issues related to item no. xxx

Name:

Signature:

Date:



JNP GROUP

CONSULTING ENGINEERS

Brighouse

Woodvale House
Woodvale Road
Brighouse
West Yorkshire
HD6 4AB

telephone

01484 400691

email

brighouse@jnpgroup.co.uk

Bristol

33 Colston Ave
Bristol
BS1 4UA

telephone

01174 721705

email

bristol@jnpgroup.co.uk

Chesham (HQ)

Link House
St Mary's Way Chesham
Buckinghamshire
HP5 1HR

telephone

01494 771221

email

chesham@jnpgroup.co.uk

Glasgow

Orient Building
16 McPhater Street
Glasgow
G4 0HW

telephone

0141 378 0808

email

glasgow@jnpgroup.co.uk

Hartlepool

The Innovation Centre
Venture Court
Queens Meadow Business Park
Hartlepool
TS25 5TG

telephone

01429 239539

email

hartlepool@jnpgroup.co.uk

Leamington Spa

Portobello House
Portobello Way
Warwick
Warwickshire
CV34 5GJ

telephone

01926 889955

email

leamingtonspa@jnpgroup.co.uk

Sheffield

MBP2 Meadowhall Business Park
Carbrook Hall Road
Sheffield
South Yorkshire
S9 2EQ

telephone

0114 244 3500

email

sheffield@jnpgroup.co.uk