Taylor Wimpey South East

Stone Pit 2, Greenhithe

Reference B – Management System Summary

3020079 – Permit Application

RSK GEOSCIENCES

JUNE 2023

RSK GENERAL NOTES

Project No.: 3020079

Title: Reference B – Management System Summary: Stone Pit 2

Client: Taylor Wimpey South East

Date: 30 June 2023

Office: RSK Environment Limited, Fourways House, 57 Hilton Street, Manchester, M1 2EJ, UK

Status: Draft

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Signature		Signature	
Date:	30 June 2023	Date:	30 June 2023
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Signature		Signature	
Date:	30 June 2023	Date:	30 June 2023

Revision control sheet				
Revision ref.	**Date**	**Reason for revision**	**Amended by:**	**Approved by:**
Rev 00	30 June 2023	First issue	n/a	see above

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FIGURES

APPENDICES

1 INTRODUCTION

1.1 Report Context

RSK Environment Limited (RSK) was commissioned by Taylor Wimpey South East to produce to prepare a Management System Summary as part of supporting documentation for an application to obtain a Bespoke Environmental Permit for their site at Stone Pit 2, St James Lane, Horns Cross, Greenhithe, Kent, hereafter referred to as the 'Site'. A Bespoke Environmental Permit is required as the Site is located on a former landfill site.

A scheme to redevelop the site proposal for the wider development site with new residential development, business premises, community and social facilities, provision of a primary school site and supporting retail. A Waste Recovery Plan has been developed and has been submitted to the Environment Agency for approval.

Activities will include:

- Excavation of surplus material from Phases 1, 2 and 3 of the development, which previously formed part of the now surrendered landfill permit for Stone Pit 2 (Permit No. EPR/BS6726IL).
- Treatment by screening to removal anthropogenic material to make suitable engineering fill.
- Re-deposition of the material under the Deposit for Recovery Permit.

Reference A of the **permit application** presents a copy of the granted planning permission issued by Dartford Borough Council.

Reference C of the **permit application** presents a set of design drawings for the permit detailing proposed 'Phase' areas, site operation layout and cut and fill plans for the Site.

1.1.1 Management System Summary

It is recognised that the management system is a requirement of any Environmental Permit and that the site must be managed and operated in accordance with it. This report provides a summary of the written management system the operator intends to prepare in accordance with the latest guidance provided by the Environment Agency and a complete management system will be in place prior to operations commencing on site.

The Management System will be heavily influenced by the Environmental Risk Assessment (ERA) produced to support the Environmental Permit application. The Management System will address all the risks outlined within the risk assessment and outline the measures which will be implemented to reduce or eliminate these risks.

Reference F of the **permit application** presents a copy of the Environmental Risk Assessment for reference purposes.

1.2 Operator and Agent

The Environmental Permit application and this summary have been prepared by RSK Environment Ltd (RSK) which is acting as an 'Agent' on behalf of the proposed 'Operator', Taylor Wimpey UK Limited, which is registered in England and Wales as Company Number 01392762.

1.3 Background

The Stone Pit 2 site at St James Lane, Horns Cross, Greenhithe, Kent is situated approximately 500 m east of centre of Stone. It is bordered by London Road to the north, a main public highway beyond which lies public open space and Stone Pit 1, former landfill. To the east of Phase 1 of the development lies Hayes Park Road, public highway beyond which lies public open space and residential properties. To the east of Phase 2 of the development lies residential properties. To the east of Phase 3 of the development Blue Water Shopping centre and lakes. To the west borders allotments and residential properties. The site is bordered to the south by Watling Street, a main public highway beyond which lies Darent Valley Hospital. A Site Location Plan is provided at **Figure 1**.

The site was a registered inert landfill site with the permit first issued in 2002 (Permit No. EPR/BS6726IL) under the Pollution Prevention and Control Regulations 2000 and subsequently the Environmental Permitting (England and Wales) Regulations 2016.

The landfill was operated in three Phases with Phase 1 being surrendered in 2019, Phase 2 being surrendered in 2021 and Phase 3 being surrendered in December 2022.

The requirement for the work is for land development/improvement to fully redevelop the land for new residential development, business premises, community and social facilities, provision of a primary school site and supporting retail.

The scheme benefits from a planning permission from Dartford Borough Council (DA/05/00221/OUT).

The volume of re-deposited material required to allow formation levels to be completed amounts to 28,558m^3.

Reference G of the permit application presents a copy of the Waste Recovery Plan submitted to the Environment Agency.

Activities at the site will be regulated under the Environmental Permitting (England and Wales) Regulations 2016 and will be carried out as defined under Annex II of the Waste Framework Directive can be summarised as follows:

- R10 Land Treatment resulting in benefit to agriculture or ecological improvement;
- R11 Use of waste obtained from any of the operations numbered R1 to R10; and
- R13 Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)

2 SITE LOCATION AND DESCRIPTION

2.1 The Site

The site is located adjacent to London Road, Greenhithe. The north the site borders London Road, public open space and Stone Pit 1, former landfill, public open space, residential properties and the Blue Water Shopping centre to the east, to the west allotments and residential properties and to the south Watling Street and Darent Valley Hospital.

The Site is 'L' shaped and covers an area of approximately 20 ha. The Site Location Plan is provided at **Figure 1**. A plan showing the site boundary is provided at **Appendix B**. The site is centred on grid reference TQ 56888 73850 (closest postcode DA9 9DU).

The ground level in the north is topographically lower than that in the south with a surface level of 29.00 m above Ordnance datum (AOD) along the northern boundary and a surface level of 54.00 m AOD along the southern boundary.

In the north of the site is a hardstanding concrete area the remainder of the site is undeveloped vegetated land with some areas of exposed soils at the ground surface.

2.2 Development Proposals

As discussed in **Section 1.3**, it is proposed to develop the land with 870 dwellings, business premises and community and social facilities including parking, public open space, associated access ways and landscaping (**Appendix C**).

The site will be developed in three Phases, Phase 1 in the north, Phase 2 in the central part of the site and Phase 3 in the southern part of the site all of which will require the reuse of site-won material from the former landfill site to reform the topographic levels (**Appendix D**).

3 MANAGEMENT

The written management system will ensure that:

- Any risks that the operations pose to the environment are identified;
- Measures required to minimise the risks are identified;
- Activities are managed in accordance with the most up to date management system;
- Performance against the management system is regularly assessed;
- The conditions of the Environmental Permit are complied with.

3.1 Management Structure and Responsibility

Whenever the site is open to receive waste, or carry out any of the waste management operations identified within the permit, it will be supervised by at least one member of staff who is suitably trained and fully conversant with the requirements of the permit regarding:

- Waste acceptance and control procedures;
- Operational controls;
- Maintenance;
- Record-keeping;
- Emergency action plans; and
- Notifications to the EA.

3.2 Technical Competence

Operations at the site will be under the overall control of a technically competent person who holds the relevant Certificate of Technical Competence (COTC) under the Waste Management Industry Training and Advisory Board (WAMITAB) scheme.

This person will attend site for the required amount of time and will ensure that attendance is recorded in a site diary.

3.3 Training

The site will be managed by sufficient staff who are trained and competent to operate the site. An assessment of staff training needs will be carried out to identify the posts for which specific environmental awareness training is needed, and to determine the scope and level of such training.

3.4 Site Security

Site access will be via a manned gate and all deliveries of wastes will be inspected upon arrival. Only authorised personnel will be allowed access to the site unaccompanied. All other visitors will need to be accompanied by site staff.

Details of security arrangements will be provided prior to operations commencing. The site will remain secure throughout development and operations in order to prevent unauthorised access.

3.5 Managing Documentation and Records

Controls will be in place to ensure that all documents are issued, revised and maintained in a consistent manner.

Examples of records and documents include:

- Policies;
- Maintenance;
- Records;
- Training Records;
- Risk Assessments;
- Site Plans;
- Procedures;
- Monitoring Records;
- Inspection and Audit reports;
- Complaints and Incident Records; and
- Site Diary.

Records will be made and kept up to date daily to reflect waste activities. All records relating to the waste acceptance will be maintained and kept readily available on site and kept for a minimum of 2 years.

Records will also be maintained that demonstrate how the environment has been protected between the date of issue of any permit and the date the site closes. These records will be retained so that they can support any application to surrender the permit.

3.6 Non-compliances

Any non-compliances detected on site will be reported, investigated and rectified.

All non-compliances identified and actioned will be recorded, along with details of anyone contacted.

3.7 Auditing

Regular internal inspections and audits will be undertaken.

3.8 Design and Quality Assurance

All relevant elements of the site (not already constructed) will be designed in accordance with recognised standards, methodologies and practices.

A competent and suitably qualified person will oversee construction activities.

3.9 Site Closure

Upon completion of all waste operations on site the site will cease to accept any further waste and eventually an application will be made to surrender the permit.

To assist with permit surrender, records will be retained to demonstrate how the land beneath the site has been protected between the date the permit was issued and the end of the permitted operations. This will include:

- A record of the measures taken to protect the environment;
- Any topographical surveys undertaken;
- Records of waste accepted and removed;
- Any monitoring results;
- An updated Site Condition Report;
- Record of any pollution incidents that may have had an impact upon the land; and
- Actions taken to clean up any incidents.

A site closure plan will be produced to support the management system and the surrender process.

3.10 Management System Review

The Management System will be regularly reviewed to ensure that all systems detailed are up to date and that all risks have been addressed. When required the Management System will be updated and a record of the version number and the changes made will be retained.

4 OPERATIONS

The management system will outline the procedures taken to ensure that excavation, waste treatment and deposit operations undertaken on site in accordance with the permit do not cause any pollution or nuisance.

4.1 Waste Types and Quantities

The waste types proposed and accepted for the permit will be listed, along with the approximate quantities and storage limits expected on site.

Only wastes suitable for their intended application will be accepted on site.

There is no intention to accept contaminated materials. Documentation will accompany all waste material accepted onto site.

If there is suspicion of contamination, waste will be tested in accordance with the waste acceptance procedure and any waste which does not meet the acceptance criteria will be segregated in a defined area and removed for off-site disposal in compliance with Duty of Care.

4.2 Waste Acceptance Procedures

The site will only accept waste onto site in accordance with the waste acceptance procedure which will become part of the overall written management system.

Reference H of the **permit application** presents a copy of the waste acceptance procedure

Waste acceptance procedures will include the procedure needed to be followed in the event that unacceptable waste is received or in the event waste needs to be quarantined while it awaits testing or removal from site.

4.3 Waste Treatment

As part of the development of the site, source segregation of the excavated materials will be carried out by the remediation contractor and following removal of the identified hotspots, these materials will be screened, and validation tested prior to re-deposition under the Waste Recovery Plan Permit to the required formation levels for the development. The reuse of made ground material from the site as engineering fill will require screening to remove the anthropogenic materials and will be subject to geotechnical validation testing.

A Remediation Strategy has been produced by the JNP Group to remove or reduce any potential risk to receptors from asbestos, PAH, hydrocarbon, metallic contamination and anthropogenic material in the made ground in all garden areas, areas of soft landscaping and public open space and to make suitable engineering fill. Works will be carried out by suitably qualified earthworks contractors (**Appendix E**).

4.4 Managing Environmental Impact

Procedures will be outlined that detail how the impact to the environment will be managed during day-to-day operations. This includes how the following potential nuisance issues and pollution risks will be managed:

- Dust;
- Noise;
- Litter;
- Odour;
- Pests;
- Mud and debris, including on roads and public highways; and
- Emissions to land, air and water.

4.5 Site Identification

A site identification board will be provided at or near the main site entrance.

The board will display the following information:

- Site name and address;
- Permit holder;
- Permit number;
- Emergency contact name and telephone number;
- EA national telephone numbers; and
- Days and hours the site is open to receive waste.

4.6 Plant and Equipment

Typical plant that will be utilised for operations at Stone Pit 2 includes, but is not limited to:

- D6 Bulldozer;
- Tracked 360° Excavator;
- Non-vibrating and vibrating Rollers;
- Tractor and water bowser and
- Tipper trucks/HGVs.

All items of plant and equipment will be maintained in accordance with the manufacturer's recommendations.

4.7 Maintenance

All maintenance audits and monitoring will be carried out in accordance with the Manufacturer's specifications, which are kept at the site or available online.

Checks on items of plant will be undertaken regularly.

When a maintenance issue is dealt with, a record will be kept. The record will be retained on site and will include the following information:

- The item requiring maintenance;
- The frequency of the required maintenance;
- Completed date and who carried out by; and
- Any comments.

5 ACCIDENTS AND INCIDENTS

This section within the management system will define the procedures taken when an accident/incident occurs and ensures that any further waste activities undertaken on site are able to take place without causing further pollution or nuisance.

5.1 Contingency Plans

The Management System will include a number of contingency plans designed to take account of possible future plans or events. It will outline how the risk of such events occurring has been reduced. These will include, but may not be limited to, events such as:

- Fire;
- Loss of containment, i.e., a spillage or leakage;
- Breakdowns;
- Security and vandalism;
- Extreme weather; and
- Flooding.

Plans will include measure taken to prevent any of the above events occurring and what to do in the event of such an incident.

5.2 Accident Prevention and Management Plan

A plan will be produced that outlines how any potential accidents will be dealt with. This includes accidents relating to events such as:

- Equipment breakdowns;
- Enforced shutdowns;
- Spillages and leakages;
- Fires;
- Vandalism;
- Extreme weather; and
- Flooding.

5.3 Complaints

The management system will outline how any complaints received by the site will be recorded, investigated and actioned.

6 REPORTING AND NOTIFICATIONS

6.1 Changes in Technical Competent Persons

The EA will be notified of any permanent changes to the assigned technically competent person (s). Copies of all certificates will be made readily available should they be required.

6.2 Waste Returns

A summary of the waste types and quantities accepted and removed from site will be submitted quarterly to the EA. This summary will be completed using the forms provided by the EA and will be submitted no later than 1 month following the end of the quarter.

6.3 Monitoring Records

Should any monitoring be required by the environmental permit, records of all required monitoring results will be submitted to the EA in accordance with the schedule specified.

6.4 Site Diary

A diary will be maintained in the site office that will be used by the site manager to record any significant activities on a daily basis. The site diary will be updated at the end of each day.

6.5 Forms

The following forms will either form part of the site diary or be retained separately on site:

- Staff Training Checklists;
- Maintenance Records;
- Accident Report Forms;
- H&S/Incident Report Forms;
- Complaints Records; and
- Daily, weekly and monthly site checks.

FIGURES

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	20.06.23	First Issue	LS	AW	AW

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Web: www.rsk.co.uk

Client: Taylor Wimpey South East

Project Name: Stone Pit 2, St James Lane, Horns Cross, Greenhithe, Kent

Description: Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	556888,173850	3020079	11101	C01	3020079-MA-111-SS-D-C-11101-C01

APPENDICES

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Taylor Wimpey South East (the "Client") in accordance with the terms of a contract between RSK and the Client dated 24 March 2023. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site,

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

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

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

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

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

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

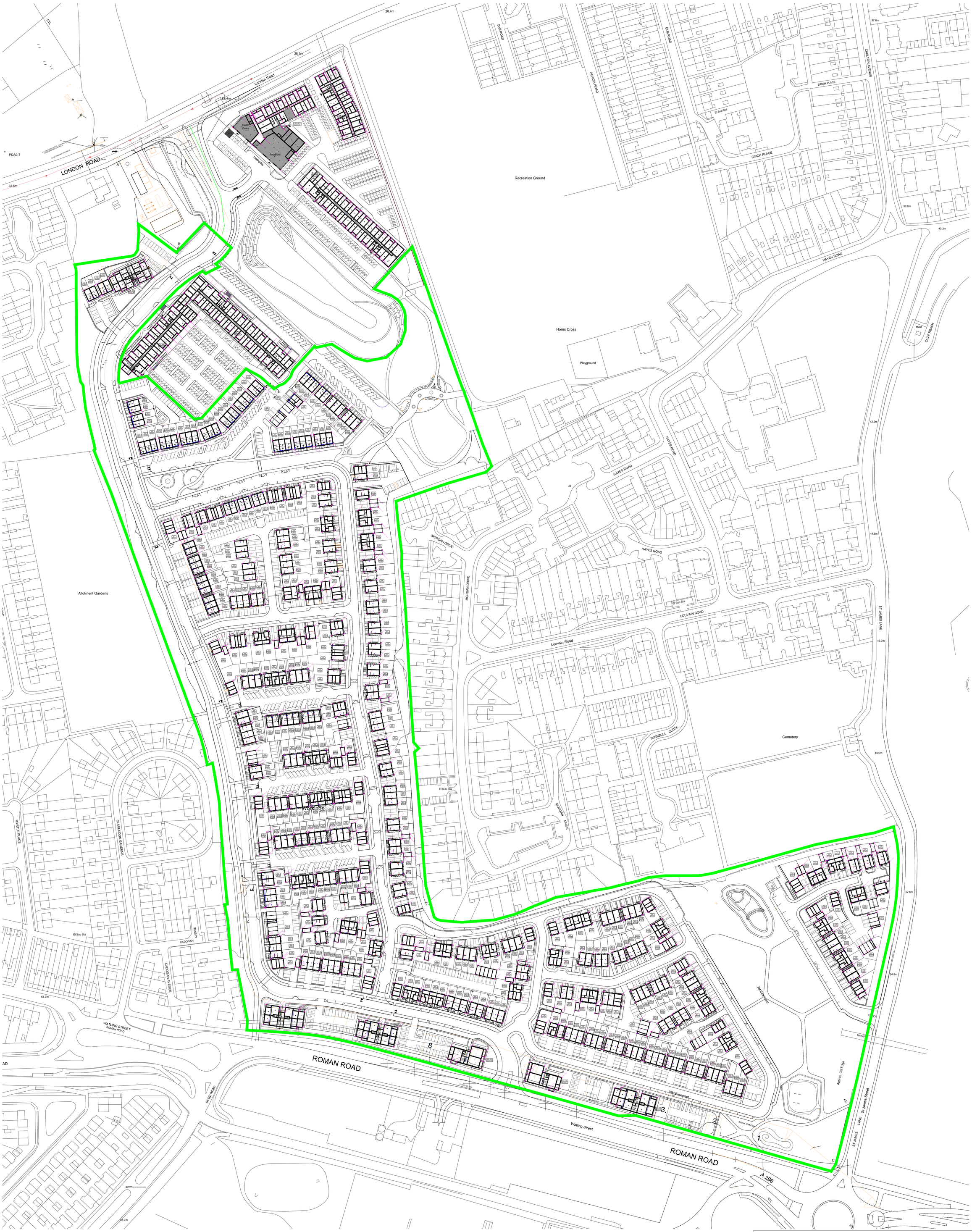
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred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

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

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

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

APPENDIX B
SITE BOUNDARY PLAN



N

0 20 40 100 200m

Operator: Taylor Wimpey UK
Site name: Stonepit 2

Material Re-use Plan
National Grid ref: TQ 56904 73696

scale 1:1000@A0

Date: 22/05/23

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:
T2	Green boundary line updated	jv	15.06.23
T3	Green boundary line updated	jv	26.06.23

revision:	details:	by:	date:

project: Stonepit 2, Dartford
title: Material Re-use Plan
date: 10/02/23 drawn by: jv
scale: 1:1000@A0 checked: km

client: Taylor Wimpey, South East

PRELIMINARY

project number 21968 | drawing number SP-011 | revision T2

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APPENDIX C
PROPOSED DEVELOPMENT PLAN

PHASE 1

PHASE 1

Phase 0 (Spine Road)

PHASE 2

PHASE 2

PHASE 3

PHASE 3

LONDON ROAD

LOUVAIN ROAD

MORGAN DRIVE

CLARENDON GARDENS

WATLING STREET

ST. JAMES' LANE

Health Centre

Retail Units

Loading Bay

Recreation Ground

Horns Cross

Playground

Allotment Gardens

Cemetery

El Sub Sta

Mast

LB

3M Easement

Tunnel

28.4m

28.1m

29.4m

37.6m

39.8m

42.9m

44.6m

46.7m

49.0m

51.7m

52.6m

54.8m

0m 25m 50m 75m 100m 125m

1:1250 Scale Bar

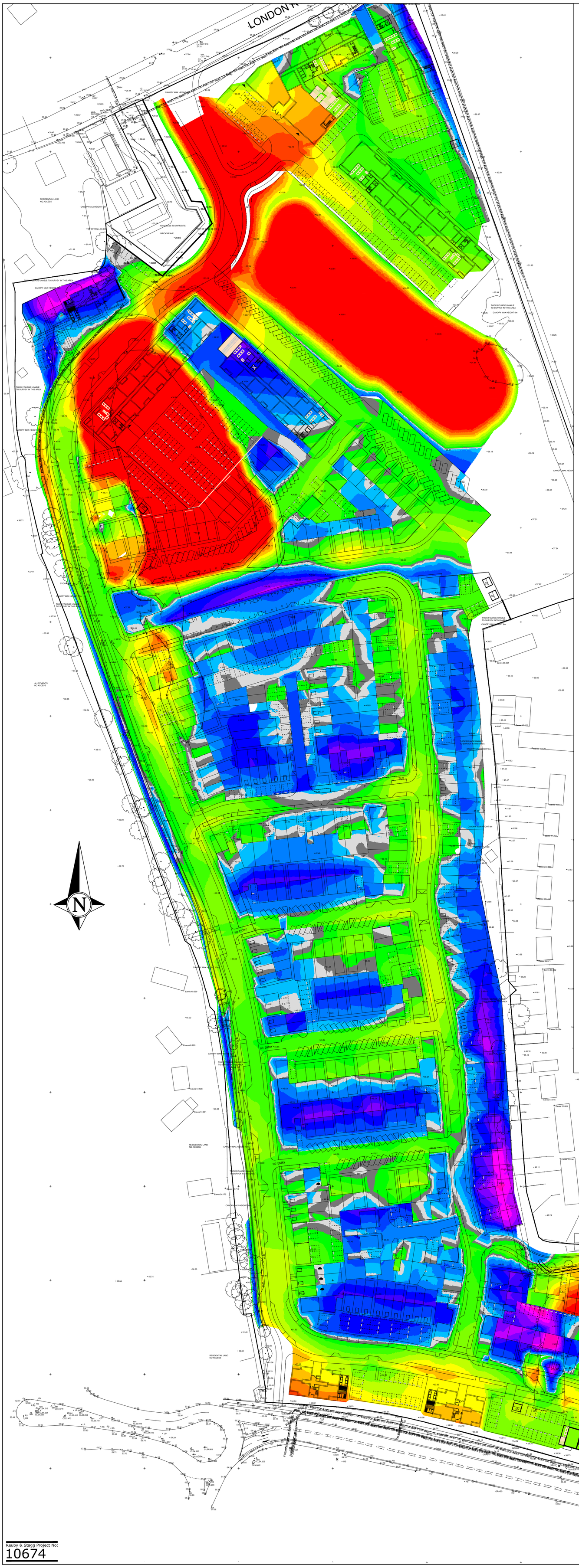
Notes	Revision	Date	By	Chkd	CDM Notes
– Copyright in this drawing remains the property of BM3 Architecture Limited. – Do not scale this drawing. Work to figured dimensions only. – Contractors and consultants are to advise BM3 Architecture Limited of any discrepancies.	Rev A - Phase 1 BTR Blocks 1, 2, 3, 5 & 6 updated, parking to Blocks 5 & 6 amended to include more integrated landscaping to address comments from Dartford. South East cell of phase 2 amended with the entrance to the parking area being relocated from the spine road to the west of the cell, to help with the proposed topography. Plot 595 type changed to ETT31 to provide frontage onto green space. Parking courts to fronts updated to include greater maneuvering space. Visitor space in phase 2 relocated to phase 3.	23.01.2022	MT	JB	

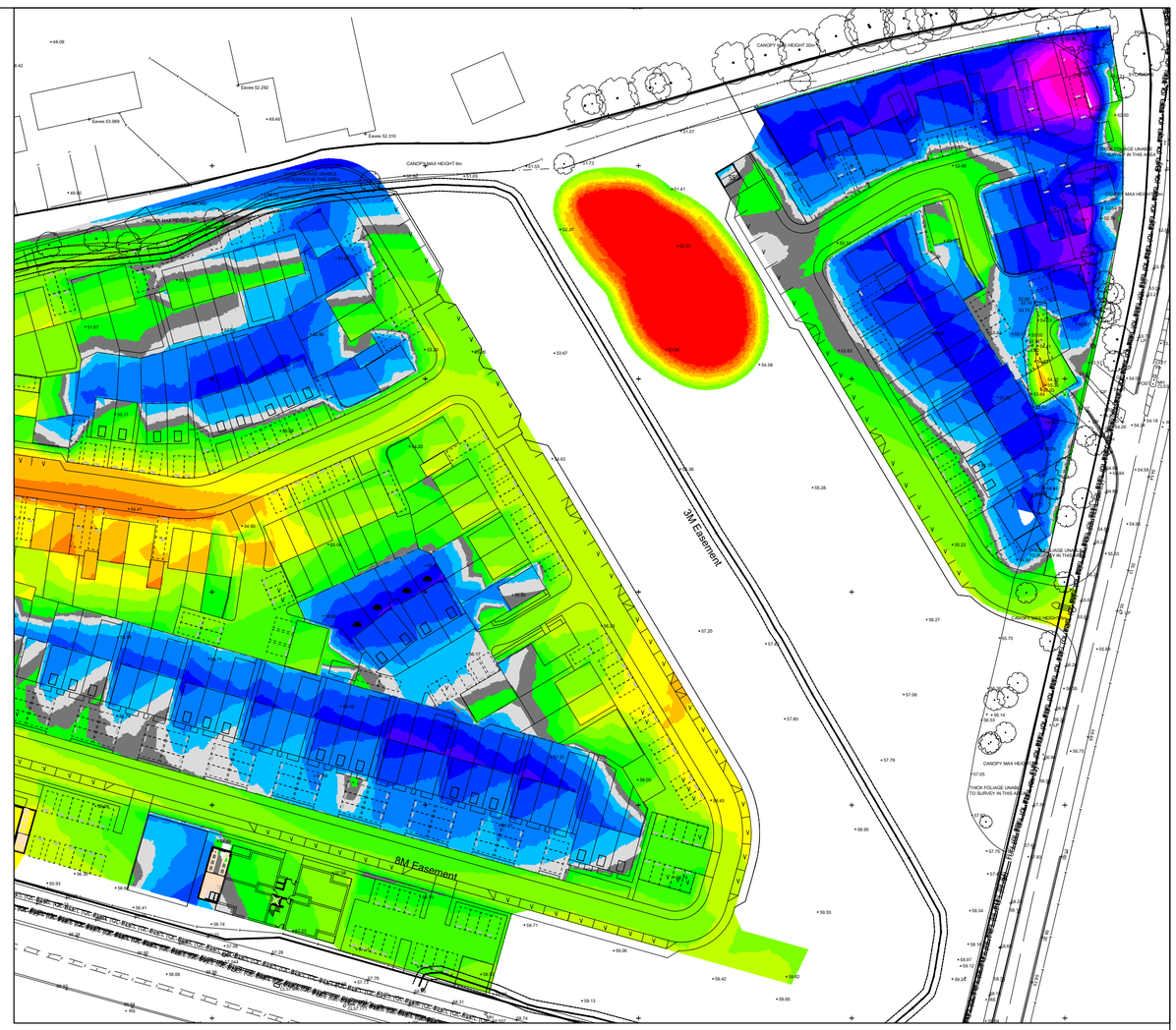
N

Project			Drawing			Client	
STONEPIT 2, DARTFORD			MASTERPLAN LAYOUT PROPOSED SITE PLAN			Taylor Wimpey	BM3
Scale	Dated	Job No.	Drawing No.	Drawn by	Checked	CiSfb Element	Revision
1:1250@A1	OCT-2022	71615	D-100	MT	JB	PLANNING	A

London Office St Marks Studios, 14 Chillingworth Road, Islington London N7 8QJ
T. 0203 861 3290 E. design@bm3.co.uk

APPENDIX D
CUT AND FILL PLAN





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

122,757m^3 CUT & 28558m^3 FILL

THEREFORE NET = CUT (+10% BULKING) – FILL = 106,475m^3 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 ARISINGS

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

DRAINAGE
(FIGURES INC 10% BULKING AND WORKING WIDTHS)

BASINS	–	VOLUME OF ARISINGS IS INCLUDED IN THE CUT AND FILL CALCULATIONS
ATTENUATION TANKS	–	6600m^3
FOUL WATER RUNS	–	3700m^3
SURFACE WATER RUNS	–	9000m^3
MANHOLES	–	3000m^3

UTILITIES

DUE TO THE DEPTH AND WIDTH OF THE ROAD BOX THE SERVICES WILL BE WITHIN THE HIGHWAY FOUNDATION	–	THE VOLUME OF ARISINGS 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 ARISINGS. 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 OUR BY ANGLIAN LAND SURVEUS 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.

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

Drawing Status: PLANNING

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

Drawing No: 21968-500
Revision: P2

Reuby & Stagg Project No: 10674

APPENDIX E
REMEDIATION STRATEGY

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

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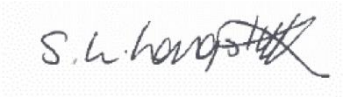
Checke  …
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FOR AND ON BEHALF OF JNP GROUP

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

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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 Repot (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 m^2 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 m^3 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 contactor 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 m^3 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 m^3 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 judgment – 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 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

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4 BS 8576. 2013. Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOC). British Standards Institution. London.

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7 BS 8601:2013. Specification for subsoil and requirements for use. British Standards Institution. London

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Figures / Drawings

Figure 1

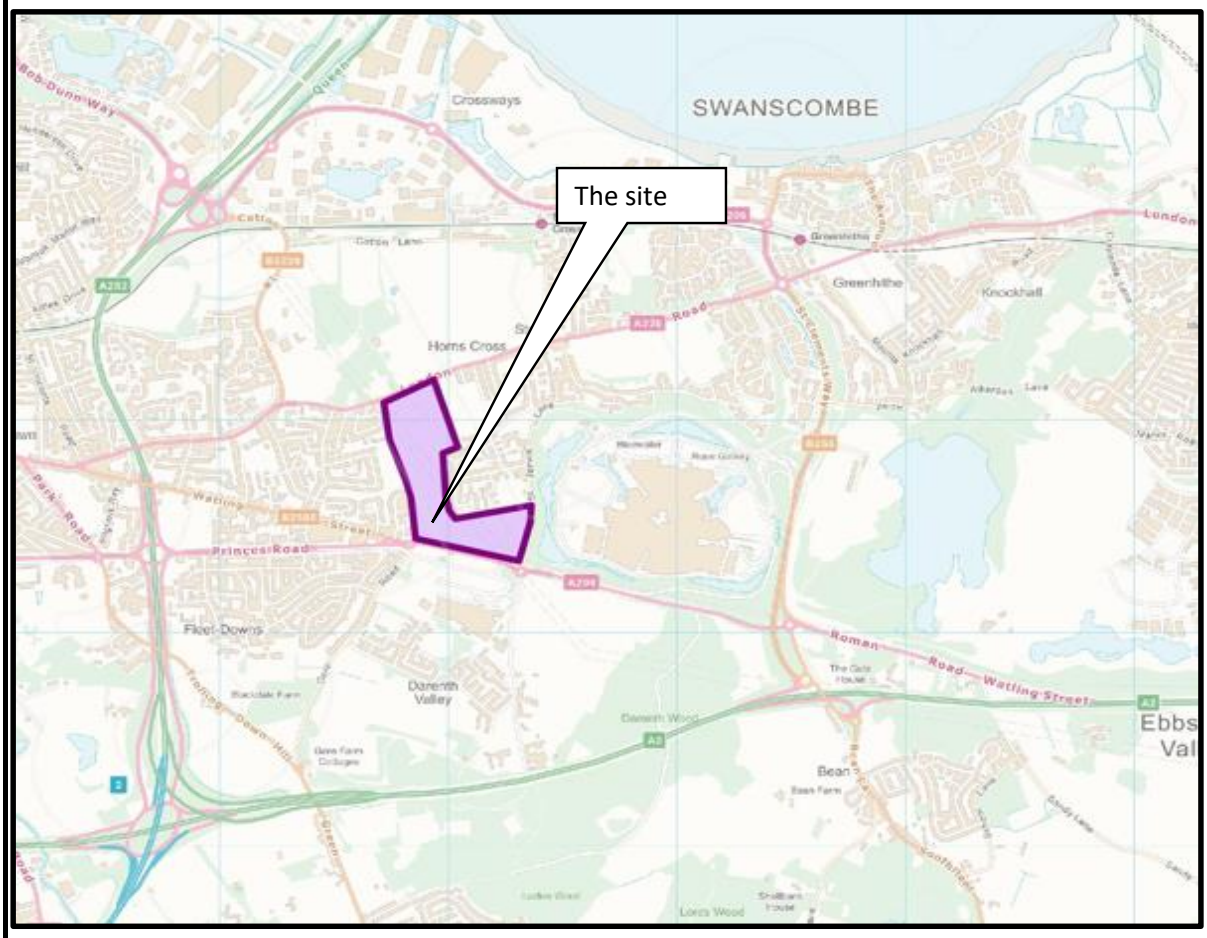
Site Location Plan

Project:

Stone Pit

Project No:

M44049



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 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

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client: Taylor Wimpey, South East

project: Stonepit 2, Dartford

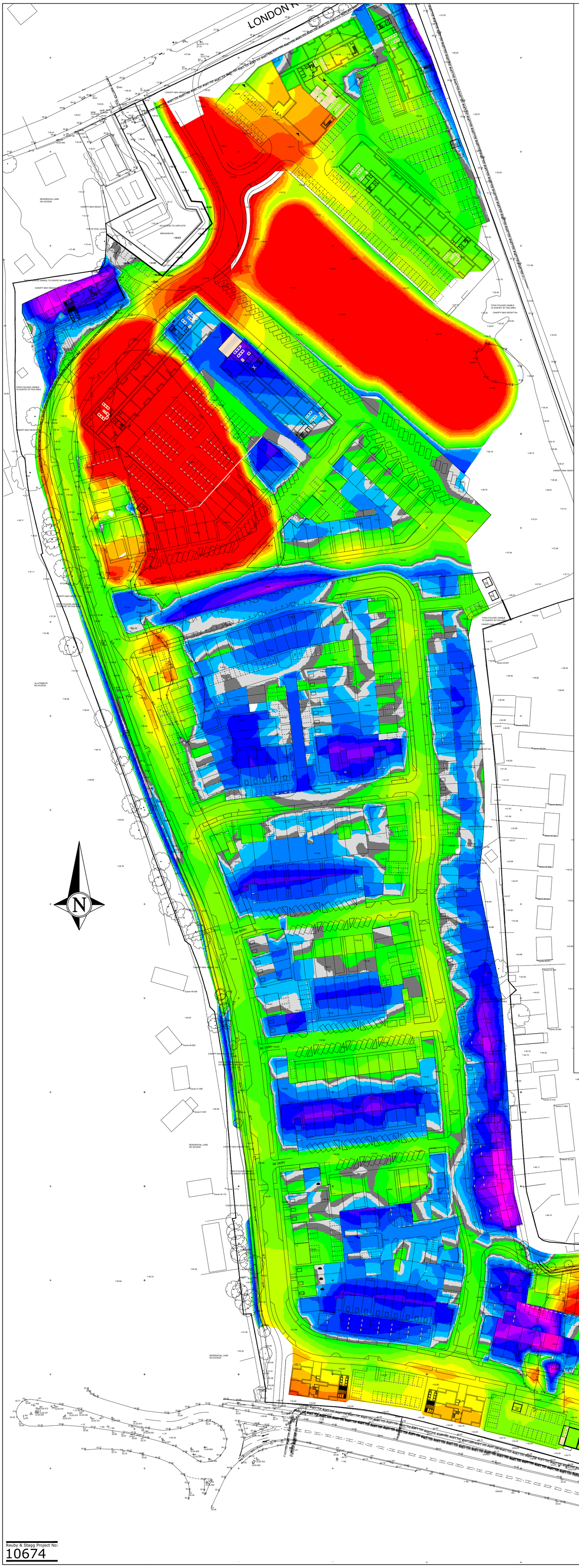
title: Site wide plan

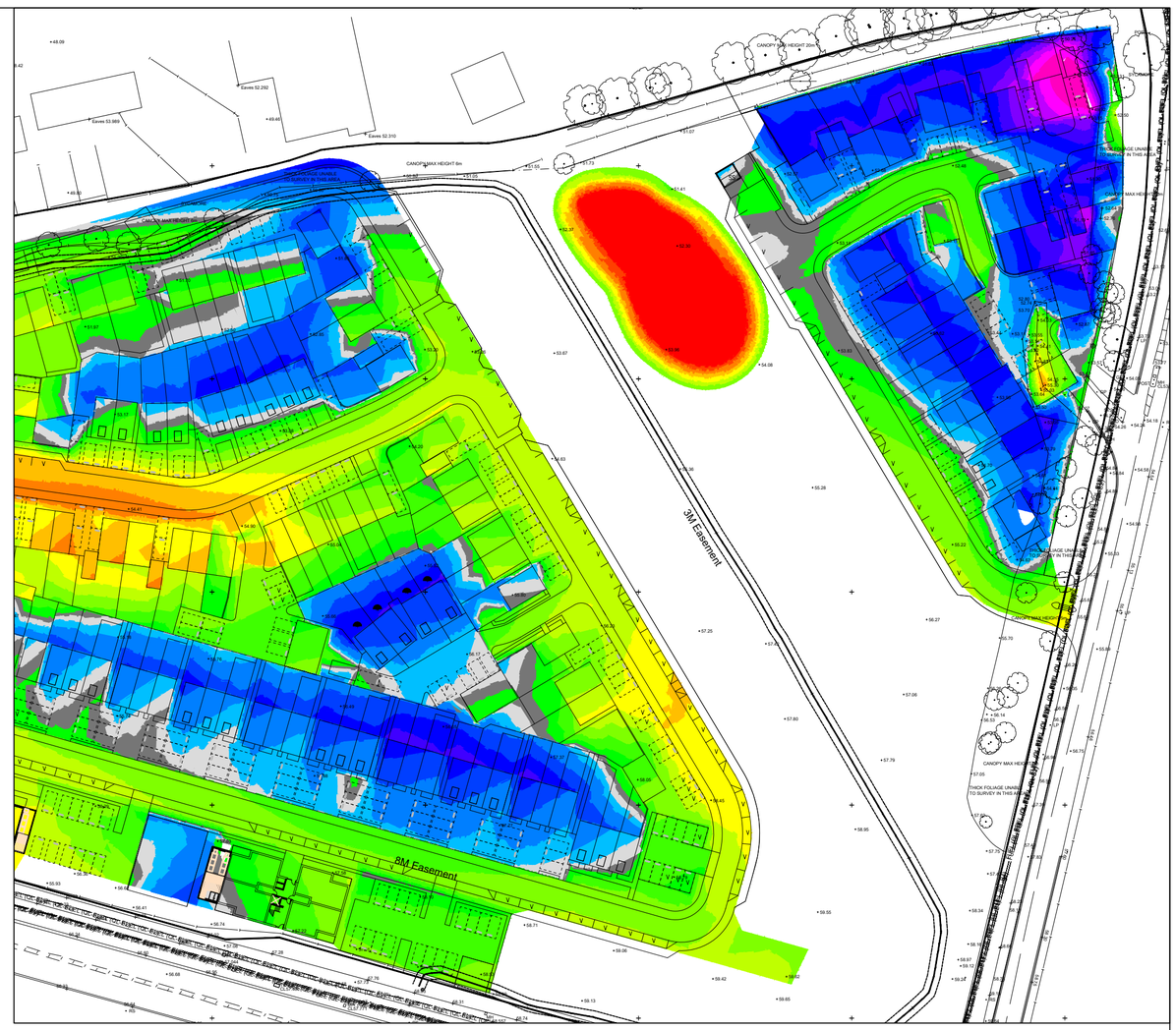
date: Jan 23 drawn by: BM3

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

122,757m^3 CUT & 28558m^3 FILL

THEREFORE NET = CUT (+10% BULKING) – FILL = 106,475m^3 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 ARISINGS

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

DRAINAGE
(FIGURES INC 10% BULKING AND WORKING WIDTHS)

BASINS	–	VOLUME OF ARISINGS IS INCLUDED IN THE CUT AND FILL CALCULATIONS
ATTENUATION TANKS	–	6600m^3
FOUL WATER RUNS	–	3700m^3
SURFACE WATER RUNS	–	9000m^3
MANHOLES	–	3000m^3

UTILITIES

DUE TO THE DEPTH AND WIDTH OF THE ROAD BOX THE SERVICES WILL BE WITHIN THE HIGHWAY FOUNDATION	–	THE VOLUME OF ARISINGS 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 ARISINGS. 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 OUR BY ANGLIAN LAND SURVEUS 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.

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

Drawing Status: PLANNING

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Drg Title: EARTHWORKS

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

Drawing No: 21968-500
Revision: P2

Reuby & Stagg Project No: 10674

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 and 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

john newton & partners jnpgroup Consulting Engineers

HazWasteOnline™

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:

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

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

FMSXQ-CJRIM-NE89C

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	Date
Hazardous Waste Classification	-

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 Ilsley

Created date: 20 Dec 2022 11:04 GMT

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
Moisture content:
12%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
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	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		22 mg/kg	1.534	33.745 mg/kg	0.00337 %		
2	barium { barium oxide }		215-127-9	1304-28-5			1.117				
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9			2.775				
4	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		9.6 mg/kg	3.22	30.911 mg/kg	0.00309 %		
5	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.1 mg/kg	1.142	3.541 mg/kg	0.000354 %		
6	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		110 mg/kg	1.462	160.771 mg/kg	0.0161 %		
7	copper { copper(II) oxide }	029-016-00-6	215-269-1	1317-38-0		190 mg/kg	1.252	237.838 mg/kg	0.0238 %		
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	770 mg/kg		770 mg/kg	0.077 %		
9	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }	080-002-00-6			1	4.4 mg/kg		4.4 mg/kg	0.00044 %		
10	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		60 mg/kg	2.637	158.201 mg/kg	0.0158 %		
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 (hydrous) (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				☑							
										Total:	0.413 %		

Key

	User supplied data
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - 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 pentaoxide; 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 unlikley 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 unlikley 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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

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

							Landfill Waste Acceptance Criteria Limits		
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								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-33669								
Chemtest Sample ID:	1499645								
Sample Ref:	ES3								
Sample ID:	DSJ20								
Sample Location:	Stone Pit								
Top Depth(m):	3.0								
Bottom Depth(m):									
Sampling Date:	30-Aug-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-33848-1
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
Order No.:	G1693
No. of Samples:	2
Turnaround (Wkdays):	7
Date Approved:	14-Sep-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	06-Sep-2022
Date Instructed:	06-Sep-2022
Results Due:	14-Sep-2022

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-33848								
Chemtest Sample ID:	1500413								
Sample Ref:	DSJ04								
Sample ID:	ES1						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-33848								
Chemtest Sample ID:	1500414								
Sample Ref:	DSJ08								
Sample ID:	ES1						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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
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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

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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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-34602-1
Initial Date of Issue:	23-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:	12-Sep-2022
Order No.:	G1693
Date Instructed:	12-Sep-2022
No. of Samples:	1
Turnaround (Wkdays):	7
Results Due:	21-Sep-2022
Date Approved:	23-Sep-2022
Approved By:	

Details:	Stuart Henderson, Technical Manager

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

							Landfill Waste Acceptance Criteria Limits		
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								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%			2.4	3	5	6
Loss On Ignition	2610	M	%			4.0	--	--	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			44	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			8.2	100	--	--
pH	2010	M				9.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			< 0.0020	--	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	0.016	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) 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
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S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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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

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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

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Sample Deviation Codes

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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

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eurofins | Chemtest
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Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-37463-1
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:	1		
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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-37463								
Chemtest Sample ID:	1516413								
Sample Ref:	BHJ06								
Sample ID:	ES12						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	Stone Pit								
Top Depth(m):	14.50								
Bottom Depth(m):									
Sampling Date:	29-Sep-2022								
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

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Test Methods

SOP	Title	Parameters included	Method summary
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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)
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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

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All water samples will be retained for 14 days from the date of receipt
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Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-37473								
Chemtest Sample ID:	1516476								
Sample Ref:	BHJ05								
Sample ID:	ES5						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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	0.5	2	25
Barium	1455	U	0.017	0.008	0.033	0.093	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	0.0096	0.5	10	70
Copper	1455	U	0.0058	0.011	0.011	0.0081	2	50	100
Mercury	1455	U	< 0.00005	0.00010	< 0.00005	0.00085	0.01	0.2	2
Molybdenum	1455	U	0.015	0.0026	0.030	0.042	0.5	10	30
Nickel	1455	U	0.0027	0.0017	0.0053	0.019	0.4	10	40
Lead	1455	U	0.0014	0.0086	0.0027	0.077	0.5	10	50
Antimony	1455	U	0.016	0.0074	0.031	0.084	0.06	0.7	5
Selenium	1455	U	0.0050	0.0029	0.0097	0.032	0.1	0.5	7
Zinc	1455	U	< 0.003	0.004	< 0.003	0.035	4	50	200
Chloride	1220	U	22	2.1	43	46	800	15000	25000
Fluoride	1220	U	1.7	0.99	3.3	11	10	150	500
Sulphate	1220	U	180	27	350	460	1000	20000	50000
Total Dissolved Solids	1020	N	330	94	650	1200	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	11	4.8	< 50	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

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Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-37473								
Chemtest Sample ID:	1516477								
Sample Ref:	BHJ05								
Sample ID:	ES10						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	Stone Pit								
Top Depth(m):	11.50								
Bottom Depth(m):									
Sampling Date:	26-Sep-2022								
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	0.5	2	25
Barium	1455	U	0.030	0.008	0.059	0.10	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0017	0.0015	0.0034	0.015	0.5	10	70
Copper	1455	U	0.014	0.0091	0.028	0.013	2	50	100
Mercury	1455	U	0.00013	< 0.00005	0.00026	0.00012	0.01	0.2	2
Molybdenum	1455	U	0.065	0.013	0.13	0.18	0.5	10	30
Nickel	1455	U	0.0070	0.0027	0.014	0.030	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.010	0.0085	0.020	0.086	0.06	0.7	5
Selenium	1455	U	0.0056	0.0035	0.011	0.037	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	160	31	320	430	800	15000	25000
Fluoride	1220	U	0.44	0.41	< 1.0	4.1	10	150	500
Sulphate	1220	U	470	120	930	1600	1000	20000	50000
Total Dissolved Solids	1020	N	900	170	1800	2400	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	18	7.1	< 50	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

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U	UKAS accredited
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U/S	Unsuitable Sample
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LOD	Limit of detection

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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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-36512								
Chemtest Sample ID:	1512321								
Sample Ref:	BHJ08								
Sample ID:	ES3						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

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<	"less than"
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SOP	Standard operating procedure
LOD	Limit of detection

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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

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-36987								
Chemtest Sample ID:	1514246								
Sample Ref:	BHJ13								
Sample ID:	ES3						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	Stone Pit								
Top Depth(m):	3.00								
Bottom Depth(m):									
Sampling Date:	15-Sep-2022								
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

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Test Methods

SOP	Title	Parameters included	Method summary
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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.
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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

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U/S	Unsuitable Sample
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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-38675								
Chemtest Sample ID:	1521974								
Sample Ref:	BHJ16								
Sample ID:	ES3								
Sample Location:	Stone Pit								
Top Depth(m):	5.00								
Bottom Depth(m):									
Sampling Date:	04-Oct-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

							Landfill Waste Acceptance Criteria Limits		
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								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-38675								
Chemtest Sample ID:	1521976								
Sample Ref:	Mound HDJ01								
Sample ID:	ES1								
Sample Location:	Stone Pit								
Top Depth(m):	0.10								
Bottom Depth(m):									
Sampling Date:	07-Oct-2022								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-38528								
Chemtest Sample ID:	1521382								
Sample Ref:	BHJ17								
Sample ID:	ES7						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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

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>	"greater than"
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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
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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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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)

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All water samples will be retained for 14 days from the date of receipt
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customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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
Order No.:	G1693
No. of Samples:	1
Turnaround (Wkdays):	7
Date Approved:	05-Sep-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	24-Aug-2022
Date Instructed:	24-Aug-2022
Results Due:	02-Sep-2022

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-32396								
Chemtest Sample ID:	1493852								
Sample Ref:	TPJ08								
Sample ID:	ES1						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
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	0.012	0.10	0.5	2	25
Barium	1455	U	0.029	0.011	0.058	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	0.0010	< 0.0005	0.0081	0.5	10	70
Copper	1455	U	0.0045	0.0050	0.0090	0.0079	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0065	0.0024	0.013	0.031	0.5	10	30
Nickel	1455	U	0.0011	0.0010	0.0022	0.010	0.4	10	40
Lead	1455	U	< 0.0005	0.0065	< 0.0005	0.053	0.5	10	50
Antimony	1455	U	0.0054	0.0036	0.011	0.039	0.06	0.7	5
Selenium	1455	U	0.0030	0.0025	0.0060	0.026	0.1	0.5	7
Zinc	1455	U	< 0.003	0.003	< 0.003	0.024	4	50	200
Chloride	1220	U	7.0	1.3	14	23	800	15000	25000
Fluoride	1220	U	0.29	0.19	< 1.0	2.0	10	150	500
Sulphate	1220	U	210	35	410	650	1000	20000	50000
Total Dissolved Solids	1020	N	500	96	1000	1700	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.0	8.9	< 50	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) 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
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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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@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
Order No.:	G1693
No. of Samples:	1
Turnaround (Wkdays):	7
Date Approved:	06-Sep-2022
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	26-Aug-2022
Date Instructed:	26-Aug-2022
Results Due:	06-Sep-2022

Results - 2 Stage WAC

Project: M44049 Stone Pit, Dartford

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-32862								
Chemtest Sample ID:	1495799								
Sample Ref:	TPJ27								
Sample ID:	WAC						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	Stone Pit								
Top Depth(m):	0.32								
Bottom Depth(m):									
Sampling Date:	23-Aug-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			0.67	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			< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			22	100	--	--
pH	2010	M				9.6	--	>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	0.0026	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

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U/S	Unsuitable Sample
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<	"less than"
>	"greater than"
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All Asbestos testing is performed at the indicated laboratory
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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 steam 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.

Step 4 Sealing

The backfilled boreholes should be completed with an impermeable plug and cap to present 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

JNP GROUP
CONSULTING ENGINEERS

License and Permit Register

Material Description	EWC	Origin	Material carrier			Disposal site/Treatment works	
			Name	License Number	Expiry Date	Name	License No: Exemption Ref.

Appendix F Waste Disposal Records

Waste Disposal Log

Waste Disposal Records

Date Removed	Waste Type	Identifying of the person removing the waste	Site the waste of being taken to and whether licensed or exempt	Waste carrier and registration number	Confirmation of delivery*

*Evidence of waste carrier registration and waste transfer or hazardous waste consignment notes for each removal of waste should be provided either as part of the plan, or filed and cross references

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

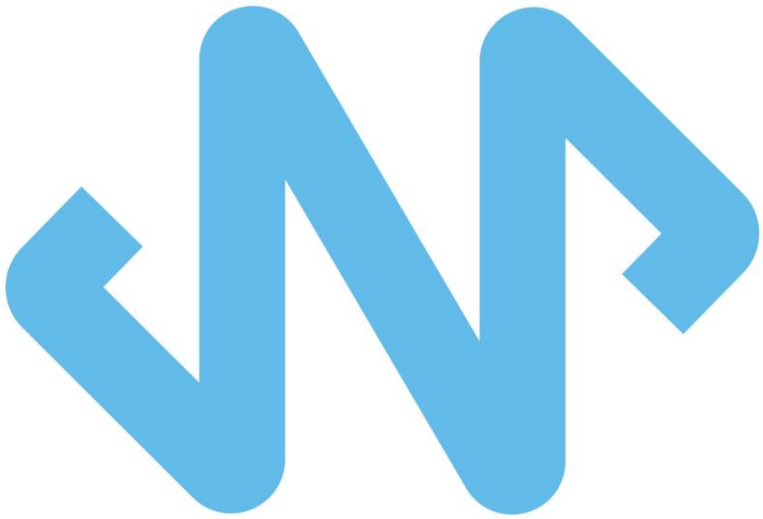
1.1	Underside of gas membrane	Check that the sub grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product 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:**



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