Proposed Pinn River SEN School
Fore Street,
Pinner,
Middlesex,
HA5 2JQ

Phase II Geo-Environmental Assessment Report

This report was produced by HSP Consulting Engineers Ltd for Gleeds Management Services Ltd on behalf of the Department for Education (DfE) as the Phase II Geo-environmental Assessment Report for the proposed Pinn River SEN School, Fore Street, Pinner, Middlesex to identify possible areas of contamination and provide an assessment of potential ground related development constraints.

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Issue & Revision History

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Executive Summary

HSP Consulting has been commissioned by Gleeds Management Services Ltd on behalf of the Department for Education (DfE) to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to the development, parameters for design and recommendations for any mitigation measures should they be required.

The site is irregular in shape and is approximately 0.65Ha in area. The site is accessed off Fore Street to the east. The site is currently an existing single storey school building with playground areas, car parking and some landscaping. To the north and around to the east woodland of predominantly deciduous trees is present both within and beyond the site boundary.

The physical methods of investigation employed were 5No window sample boreholes to a maximum depth of 5.00m begl. The geology generally comprised topsoil and Made Ground to a maximum depth of 0.90m begl. Underlying the Made Ground is bedrock geology belonging to the Thames Group which was encountered across the site to a maximum depth of 5.00m. The formation generally comprised firm to stiff sandy gravelly CLAY.

The natural deposits encountered are considered to be a suitable formation layer where they are encountered in a firm to stiff condition from a minimum of 0.90m in depth, although locally foundations may need deepening to up to 1.40m begl. Where natural fine deposits, belonging to the Lambeth Formation and Thames Formation, are encountered at founding depth, traditional strip footings are considered appropriate and an allowable bearing pressure of 150kN/m^2 should be readily achievable when utilising a 0.6m strip foundation within the firm to stiff fine deposits, reducing to 115kN/m^2 around WS4 and 5 where softer ground was identified.

Mature and semi mature trees were identified on site, including an oak tree approximately 10m from the proposed development, with further mature and semi mature trees within 30m of the proposed building footprint to the north of the site. The fine deposits of the Thames Formation are of medium volume change potential. Foundations in the east and north of the proposed development should be deepened and designed in accordance with NHBC Chapter 4.2 to a minimum of between 2.0 and 2.15m depth.

It is considered appropriate to adopt a basic Design Sulphate Class of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1S.

The chemical analysis and risk assessment undertaken indicates that the soils on site should be considered suitable for the proposed end use and mitigation is not required during redevelopment, subject to the approval of the local Environmental Health Officer.

Based on the chemical analysis report it is considered that specialist materials are likely to be required for water supply pipes at the site. However, confirmation of supply pipes should be sought from utility providers.

The executive summary contains an overview of key findings and conclusions. However, no reliance should be placed on the executive summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the executive summary.

1. Introduction

1.1 Background

At the time of writing the final design proposals have not been confirmed however, it is understood that the proposed development will include the construction of a new teaching facility with associated soft and hard landscaped areas. The architectural concept information is presented in Appendix I.

1.2 Client Brief & Scope

HSP Consulting has been commissioned by Gleeds Management Services Ltd on behalf of the DfE to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to the development, parameters for design and recommendations for any mitigation measures should they be required.

The report presents the following information:

- a summary of the previous Geo-Environmental Reports (Section 1.4 below),
- details of the ground investigation undertaken, and the ground conditions encountered,
- details and results of the geotechnical testing and contamination analysis,
- recommendations for mitigating constraints to the proposed development where appropriate and providing parameters for foundation design.

Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites.

1.3 Report Objectives

The objectives of this report are to:

- establish the geological and hydrogeological conditions using existing available/published information;
- summarise available information and identify site specific geotechnical and environmental hazards which may place a constraint upon the proposed site use;
- produce an updated Conceptual Site Model identifying potential pollution linkages between sources of contamination, pathways and receptors.

1.4 Limitations

The recommendations made in this report are based on the findings of the intrusive ground investigation undertaken by HSP Consulting Ltd on 21st March 2018.

1.5 Previous Reports

HSP Consulting Ltd has previously produced a Phase I Desk Study report for the site:

- C2734/PI – Grangewood SEND School - Phase I Geo-Environmental Desk Study Report, March 2018.

2. Review of Existing Information & Geoenvironmental Setting

2.1 The Site

2.1.1 Location

The site is located off Fore Street and the proposed building will see the existing school demolished to accommodate the development. The site is located off Fore Street, approximately 7.8km south of Watford City centre. The approximate National Grid Reference for the centre of the site is (NGR) 509920, 188820.

2.1.2 Description

The site is irregular in shape and is approximately 0.65Ha in area. The site is accessed off Fore Street to the east.

The site is currently an existing single storey school building.

The site is surrounded by 2m high wire mesh fencing to the north east and around the northern boundary within the woodland. The school borders the Coteford Junior School to the south and southeast and currently a shared plant room sits between the two sites.

From northwest, to the north and around to the east a large number of semi-mature and mature almost extensively deciduous trees are present both within and beyond the site boundary.

The trees around the north of the site to the rear of the building and play area are almost extensively approximately one metre higher than the existing building level. The site falls to the southeast generally and beyond the site the level appears to fall this way across the Coteford junior school playing fields. It is anticipated that the building is at a reduced level and that the woodland is not on a filled plateau.

Playground areas around the school are all effectively hard cover surfaced with a variety of soft fall surfacing's segregating various play equipment with metal fencing dividing each area.

2.1.3 Surrounding Land Use

The main features of interest identified are:

North:	Woodland.
East:	Residential properties.
South:	Woodland and residential properties beyond.
West:	Residential properties

2.1.4 Proposed End Use

Gleeds Management Services Ltd and the DfE propose to demolish the existing Grangewood school and construct a new teaching facility with associated hard and soft play areas. Concept plans are included in Appendix I.

2.2 Geology

2.2.1 Made Ground

The BGS mapping does not indicate any made ground on the site. Made ground is likely to be present associated with development of the site.

2.2.2 Superficial Deposits

The BGS mapping indicates no superficial deposits on the site.

2.2.3 Bedrock Geology

BGS bedrock mapping indicates the site is underlain by the Lambeth Group and Thames Group.

The Lambeth Group is described by the BGS as '*Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate.'*

The Thames Group is described by the BGS as *'bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation.'*

2.2 Pertinent Site Sensitivity Information

Based on the information collated for the desk study, the geo-environmental setting of the site is summarised as follows:

- The site is shown as part of a woodland from 1864 up until 1990 when *Grangewood School* is recorded, still present on the most recent mapping (2018).
- Historically the area around the site was predominantly woodland and agricultural before residential development occurred to the west and south from 1935 to 1965. Earthworks are recorded to the north east of the site from 1960 and still recorded on the most recent mapping.
- The site is underlain by bedrock of the Lambeth Group and Thames Group.
- Made ground is not indicated within the site boundary on the published geological mapping, however made ground associated with the development of the site may be present.
- The underlying Lambeth Group and Thames Group bedrock geology are designated as Unproductive Strata.

Based on the above, the environmental sensitivity of the site can be considered to be Low at this stage.

3. Fieldwork & Factual Information

Site work was carried out on the 21st March 2018. Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations (Ref. 6) and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites (Ref. 8).

The exploratory holes were positioned generally across the site at locations determined to provide information for foundation design and obtain representative soil samples for geotechnical and geo-environmental analysis whilst the existing school building was still in place.

3.1 Exploratory Methods

The physical methods of investigation employed were 5No window sample boreholes to a maximum depth of 5.00m begl. The exploratory holes were logged and sampled by an Engineer from HSP Consulting Ltd and the logs are presented in Appendix II. The exploratory hole locations are shown on the Ground Investigation Layout Plan presented in Appendix III.

Fragmentary bulk, disturbed and undisturbed samples were recovered from materials revealed within all the exploratory holes. Geo-environmental samples, placed in plastic tubs and glass jars supplied by the laboratory, were also obtained specifically for chemical analysis. The samples were taken to UKAS accredited laboratories for further examination and testing.

3.2 In-situ Testing

3.2.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were carried out at 1.00m intervals in the boreholes. The SPTs were undertaken in accordance with BS 1377:1990 and the results are included on the appended borehole logs (Appendix III).

3.3 Laboratory Testing

The laboratory testing schedules were prepared by HSP Consulting Engineers Ltd.

3.3.1 Geotechnical Testing

Geotechnical testing has been scheduled to be undertaken by a UKAS accredited laboratory as part of the works at the site:

- Plasticity indexes
- Natural moisture content
- Sulphate Analysis

The laboratory testing was carried out by Professional Soils Laboratory Ltd (UKAS accredited, laboratory No.4043) in accordance with BS1377:1990 using calibrated equipment specifically for the British Standard. The results are included in Appendix IV.

3.3.2 Chemical Analysis

The geo-environmental samples retained specifically for chemical analysis were stored in cooled containers until delivery to the laboratory by courier.

Chemical analysis was scheduled on five soil samples for the presence of a selected suite of potential contaminants as outlined in the tables below:

Exploratory Hole Location & Depth	Sample Description
WS1 0.40-0.50m	Made Ground [1,4]
WS2 0.30-0.40m	CLAY [1,3]
WS3 0.25-0.35m	CLAY [1]
WS4 0.25-0.35m	Made Ground [1,2,3,4]
WS5 0.35-0.45m	Made Ground [1,4]

[1] HSP Standard Suite, [2] BRE Sulphate Suite, [3] Organic Matter, [4] Asbestos Screen

Metals	Cadmium	Chromium (III & VI)	Copper
	Lead	Mercury	Nickel
	Zinc		
Semi Metals and Non-metals	Arsenic	Boron	Selenium
Others	pH	Asbestos	
Inorganic Chemicals	Cyanide	Sulphate	Sulphide
Organic Chemicals	PAH (US EPA 16)	TPH (CWG)	Phenol

The contamination analysis was carried out by Chemtest Environmental Ltd (UKAS accredited, laboratory No. 2183) during the period 26th March to 29th March 2018. The results are presented in Appendix VI.

3.4 Ground Conditions

3.4.1 Published Geology

The published geology indicates the site is underlain by bedrock clays of the Lambeth Group and Thames Group as described in sections 2.2.2 and 2.23 respectively.

3.4.2 Ground Conditions on site or General Geology & Revealed Strata

The exploratory hole data confirms the published information. The strata generally comprises:

Table 1 – Encountered Ground Conditions

	Strata	Depth (mbegl)	Thickness (m)	Description
Anthropogenic	MADE GROUND	G.L – 0.17	0.17	MADE GROUND comprising asphalt concrete
	TOPSOIL	G.L – 0.20	0.20	TOPSOIL
	MADE GROUND	0.08 – 0.90	0.78	MADE GROUND comprising brown sandy gravelly CLAY with gravel of flint, brick and concrete
Bedrock	THAMES GROUP	0.07 – 5.00	3.60	Firm to very stiff greenish grey and brown sandy locally gravelly CLAY
		0.15 – 5.00	4.80	Firm to very stiff brown and grey sandy locally silty locally gravelly CLAY
		1.70 – 3.40	1.70	Stiff brown grey mottled CLAY
		3.90 – 5.00	1.10	Stiff brown green grey very sandy silty CLAY
		5.00 – 10.00	5.00m	Firm to stiff grey sandy CLAY

3.5 Groundwater Levels

Groundwater was not encountered within the exploratory holes undertaken at the site. Groundwater level monitoring will be undertaken as part of the gas monitoring.

3.6 Ground Gas Monitoring

Ground gas monitoring has been undertaken on one occasion as part of this investigation.

3.7 Visual and Olfactory Evidence of Contamination

No visual or olfactory evidence of contamination was noted during the ground investigation.

4. Geotechnical Assessment

4.1 Detailed Ground Model

For the purpose of this foundation assessment the information gained from the window sample boreholes and the engineers observations have been included. The borehole logs are presented in Appendix II.

4.1.1 Made Ground

Made Ground was encountered to a maximum depth of 0.85m begl (WS5). Made ground was generally absent within the exploratory hole locations across the site.

4.1.2 Topsoil

Topsoil comprising grass overlying brown clay to a maximum depth of 0.20m begl was encountered within window sample boreholes undertaken in soft landscaped areas.

4.1.3 Thames Group

Bedrock geology belonging to the Thames Group comprised predominantly firm to stiff brown grey sandy slightly gravelly CLAY. The base of the formation was not penetrated.

4.1.4 In-situ Testing and Assessment

A series of Standard Penetration Tests (SPT's) undertaken within all boreholes have returned SPT 'N' values of 9 - 24 at 1.00m begl. The following table summarises the N values at depth across the site within the natural strata.

Table 2 – SPT N Values

Depth (m)	Range of 'N' Values	Mean 'N' Value	Description
1.00m	9-24	16	CLAY
2.00m	9-30	24	CLAY
3.00m	14-30	26	CLAY

Four plasticity index and moisture content tests have been undertaken in the laboratory on disturbed samples of the cohesive deposits. The results indicate compliance with the definition of soils of high plasticity (CH) after the classification system of BS5930: 2015. These soils are generally considered to be of low to medium Volume Change Potential in accordance with the National House Building Council (NHBC) Standards, Chapter 4.2: 2007. (Ref 10).

Table 3 – Plasticity Index Results

Sample Ref:	Laboratory Material Descriptions	LL (%)	PL (%)	PI (%)	% passing 425µm	Modified PI (%)*	Soil Class	MC (%)
WS2 @ 1.70m	*Brown slightly gravelly slightly sandy CLAY*	62	26	36	92	33.12	CH	17
WS3 @ 1.90m	*Brown slightly gravelly slightly sandy CLAY*	63	27	36	96	34.56	CH	17
WS4 @ 1.50m	*Brown slightly gravelly slightly sandy CLAY*	60	26	34	93	31.62	CH	21
WS5 @ 4.20m	*Brown slightly gravelly sandy CLAY*	42	22	20	90	18	CI	23

4.2 Earthworks

Based on the proposed development plans, significant earthworks operations are not expected at the site due to constraints presented by the existing ground levels at the boundaries.

4.3 Excavations

Excavations to proposed formation level for new foundations and infrastructure should be achievable with standard plant.

It is recommended that all support systems are continually assessed by fully trained or experienced personnel.

Groundwater was not encountered at the site. However, it should be noted that groundwater levels may vary due to seasonal variations or other effects. Should shallow groundwater entries be encountered at the site during groundwork operations traditional sump and pump dewatering should be sufficient.

4.4 Foundations

At the time of writing the final design proposals have not been confirmed however, it is understood that the proposed development will include the construction of a new teaching facility with associated soft and hard landscaping areas.

For the purpose of this foundation assessment the information gained from the window sample boreholes has been included.

The natural deposits encountered are considered to be a suitable formation layer where they are encountered in a firm to stiff condition from a minimum depth of 0.90m, however localised deepening of foundations around WS4 & 5 maybe required where in-situ testing indicates firm ground conditions, and also where the foundations are within an influencing distance of trees.

Current occupation of the school and metal fencing presented obvious constraints to access of some areas during the investigation. It would be advantageous to undertake additional boreholes in currently inaccessible areas around and within the existing building footprint whilst vacant, or post demolition.

Where natural fine (cohesive) deposits, belonging to the Thames Formation, are encountered at founding depth, traditional strip footings are considered appropriate and an allowable bearing pressure of 150kN/m^2 should be readily achievable when utilising a 0.6m strip foundation within the stiff fine deposits. This reduces to 115kN/m^2 in the location of WS4 & 5.

Mature and semi mature trees were identified on site, including an oak tree approximately 10m from the proposed development, with further mature and semi mature trees within 30m of the proposed building footprint to the north of the site. The fine deposits of the Thames Formation are of medium volume change potential. Foundations should be deepened and designed in accordance with NHBC Chapter 4.2 Building near trees (Ref. 10), in the east where the oak and hornbeam are within an influencing distance and within the footprint foundations are likely to be a minimum of 2m -2.15m depth and heave precautions will be required. The foundation

depth should be increased/decreased in steps in accordance with the NHBC Standards and the foundations will need to be reinforced.

4.5 Ground Floor Slab

Made Ground in excess of 600mm was encountered during the ground investigation in WS5 only. Soils of medium volume change potential were identified along with high water demand trees. It is therefore anticipated that a suspended floor slab will be required for the proposed development (Ref 10). It may be possible for sections of slab to be isolated and ground bearing where they are outside the influence of trees.

4.6 Concrete Classification

The results of sulphate and pH testing carried out on selected soil samples taken during this investigation have been compared with the recommendations outlined in BRE Special Digest 1, Part 1: 2005.

The guidelines given in BRE Special Digest 1 are based upon a site classification relating to its previous usage. It is considered appropriate to define this site as a 'brownfield' location for the purposes of concrete classification.

On the basis of the above, it is considered appropriate to adopt a basic Design Sulphate Class of DS-1 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-1s.

4.7 Drainage

Soakaway testing was not undertaken as part of this investigation. However, given the fine deposits encountered as shallow depths, it is unlikely that it would be possible to utilise infiltration drainage.

5. Environmental Assessment

5.1 Introduction

The approach to the human health risk assessment reported here follows the principals given in CRL 11, i.e. application of the following assessment hierarchy:

- Tier 1 risk screening by establishment of potential pollutant linkages, i.e. the preliminary conceptual site model (PCSM), or
- Tier 2 generic quantitative assessment using generic assessment criteria (GACs) that represent 'acceptably low' risk, or
- Tier 3 quantitative risk assessment using site specific assessment criteria (SSACs) that represent 'unacceptable risk', or where generic assessment criteria are not available, or they are not applicable to the CSM.

The results of laboratory analysis have been screened against GACs including the Defra Category 4 Screening Levels (C4SL) and LQM and CIEH S4ULs for Human Health Risk Assessment (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3180. All rights reserved). (Refs 10 and 11 respectively).

In the absence of a standard scenario for a school environment the standard exposure scenario of residential without home grown produce has been used to identify potential exposure pathways for human health receptors. Controlled water, flora and fauna and property receptors have also been included within the CSM.

It should be noted that organic contamination (PAH, TPH and BTEX) have been screened against the GAC for 1% Soil Organic Matter (SOM).

The assessment of PAHs is undertaken using the surrogate marker approach; recommended by Health Protection Agency (2010) guidance, providing the PAH profile is sufficiently similar to the coal tars tested by Culp et al (1998). Where PAH profile is not sufficiently coal tar like the TEF method is adopted using the LQM and CIEH S4ULs. Prior to assessment a PAH profile is generated for all samples analysed for PAH using the LQM PAH Profiling Tool v1.3, the graphical output is presented in Appendix VI.

5.2 Assessment of Soil Analysis Results

Five samples, as detailed in section 3.3.2, were scheduled for analysis from the development area. These provide a basis for characterising the soils to outline the potential impacts on human health and any environmental receptors from any contamination found.

The screening process for on-site human health receptors show that the Generic Assessment Criteria (GACs), representative of minimal risk for a residential without plant uptake setting were exceeded for one contaminant at one location at the site, as detailed in the table below.

Table 4 – GAC Exceedances

Contaminant	GAC (mg/kg)	No. of exceedances	Concentration (mg/kg), sampling location and depth (m)
Arsenic	40[1]	1	72 – WS1, 0.40-0.50m

[1] C4SL, [2] SGV, [3] LQM & CIEH GAC, [4] SSAC.

This investigation has identified that the ground conditions around WS1 comprised made ground containing demolition material. The screening criteria representative of acceptably low risk to the end use setting were exceeded for arsenic in one location within one sample of made ground.

Site Specific Assessment Criteria's (SSAC's) have been generated for the above contaminants using the CLEA 1.071 model (Ref. 20), the output is presented in Appendix VII. The generated SSACs are outlined in the below table:

Table 5 – SSAC CLEA V1.70 Model

Contaminant	CLEA v1.70 SSAC (mg/kg)	Pathway	No. of exceedances	Maximum identified concentration, sampling location and depth (m)
Arsenic	440	Combined	0	72 – WS1, 0.40-0.50m

The site specific assessment criteria for arsenic are lower than the concentrations exhibited in the samples tested.

We therefore consider that the potential risk associated with the interaction between the near surface soils and end users of the site including construction workers is low.

Three of the soil samples derived of Made Ground were submitted for an asbestos screen and identification. No asbestos was identified.

5.3 Human Health Mitigation

The concentrations of potential contaminants recorded at the site did not exceed the GAC's for a residential without plant uptake end use or the SSAC and are therefore not considered to pose an unacceptable level of harm to the proposed end users of the site. Further works or mitigation will not be required.

Should any obvious evidence of unexpected contamination be encountered during the redevelopment works it should be reported to HSP so that an inspection can be made, and appropriate sampling and assessment work be carried out.

Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to potentially contaminated soils and dust. Consideration should be given to the HSE document HSG 66 'Protection of workers and the General Public during Redevelopment of Contaminated Land'.

The approval of the local Environmental Health Officer should be sought with respect to the soil contamination assessment and mitigation proposals.

5.4 Water Supply

The environmental testing for the site has been compared to the following document in order to assess the most appropriate pipe material that should be used upon the site for mains water supply:

> 'Guidance for the selection of water supply pipes to be used in Brownfield sites – UK Water Industry Research – Ref: 10/WM/03/21.'

Based on the chemical analysis report it is considered that specialist materials are unlikely to be required for water supply pipes at the site. Confirmation of supply pipes should be sought from utility providers.

5.5 Ground Gas Risk Assessment

No plausible sources of potential ground gas were identified with the Desk Study (Ref 1). However ground gas concentrations have been monitored on one occasion in order to obtain an indication of the ground gas regime at the site. The results indicate that methane has not been recorded above the monitor's limit of detection. Carbon dioxide has been recorded at a maximum steady concentration of 0.5% vol in air. Positive gas flows have not been recorded above the limit of detection during the monitoring visit. From the results above, the maximum steady state gas screening value for the site is 0.0005l/hr.

The assessment below is therefore based on the use of the site as a school. For the purpose of this assessment, the school is classified as Building Type B; as outlined in Table 3 of BS8485:2015 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings (Ref 15).

Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 1 and therefore, no gas protection measures are required.

5.6 Waste Classification

The results of the chemical testing have been assessed using web-based software for classifying hazardous waste, using HazWasteOnline^{tm}. The materials tested are likely to be classified as non-hazardous waste. The results are included in Appendix VII.

5.7 Updated Conceptual Site Model

The PCSM and Summary of plausible pollutant linkages was produced by undertaking a Source-Pathway-Receptor analysis of the site and is present in the Desk Study (Ref. 1). Based on the findings of this and the previous investigation the updated conceptual site model has been updated and is presented in the table below.

Table 6 - Updated Conceptual Site Model.

Source	Pathway	Receptor	Consequence	Probability	Risk	Comments
On site **S1:** Made Ground associated with development of the site.	**P1:** Human uptake pathways	**R1:** End Users **R2:** Construction and maintenance workers	Medium	Low	Low	Elevated concentrations of contaminants above the GAC & SSAC have not been identified within the Made Ground, topsoil and natural material on site, therefore mitigation measures are not required. The risk is considered to be VERY LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man-made). **P4:** Surface runoff.	**R3:** Controlled Water: Secondary A **R4:** Controlled Water: Surface Water	Medium	Very Low	Low	The underlying geology comprises fine soils belonging to the Lambeth Group and Thames Group which are classified as Unproductive strata. Given the limited arsenic contamination encountered on the site, the risk is considered to be LOW.
Off Site (within 250m) **S2:** Made Ground associated with development in the area and earthworks recorded to the north east of the site. **S3:** Historical & Contemporary Land Use: Woodland/Agricultural land	**P2:** Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. **P3:** Migration of contaminants along preferential pathways (man-made). **P4:** Surface runoff. **P5:** Vertical and lateral migration of ground gases and/or vapour.	**R1:** End Users **R2:** Construction and maintenance workers **R4:** Property, services and substructures **R5:** Adjacent Residential Properties	Mild	Very Low	Very Low	Elevated concentrations of contaminants have not been identified within the Made Ground, topsoil and natural material on site, therefore mitigation measures are not required. The risk is considered to be VERY LOW. The results of sulphate and pH testing carried out on selected soil samples taken during this investigation have been compared with the recommendations outlined in BRE Special Digest 1, Part 1: 2005. On the basis of the above, it is considered appropriate to adopt a basic Design Sulphate Class of DS-1 together with and Aggressive Chemical Environment for Concrete (ACEC) of AC-1s. Based on the chemical analysis report it is considered that specialist materials are likely to be required for water supply pipes at the site. However, confirmation of supply pipes should be sought from utility providers.
	P6: Root uptake.	**R6:** Proposed Flora and fauna	Mild	Low	Low	The plans do not indicate any vegetable planting or fruit bearing trees. Provided this remains the case the risk of uptake to proposed flora and fauna is LOW.

6. Development Constraints and Recommendations for Further Work

6.1 Development Constraints

The desk study and ground investigation have identified the following development constraints at the site:

Contamination in Made Ground

The concentrations of potential contaminants recorded at the site did not exceed the GAC's for a residential without plant uptake end use or the SSAC and are therefore not considered to pose an unacceptable level of harm to the proposed end users of the site.

Further works or mitigation will not be required subject to approval by the local Environmental Health Officer approval.

6.2 Additional Investigation

Further investigation will be required in areas that are currently inaccessible. This could take place following demolition, or once occupation of the school has ended.

7. References

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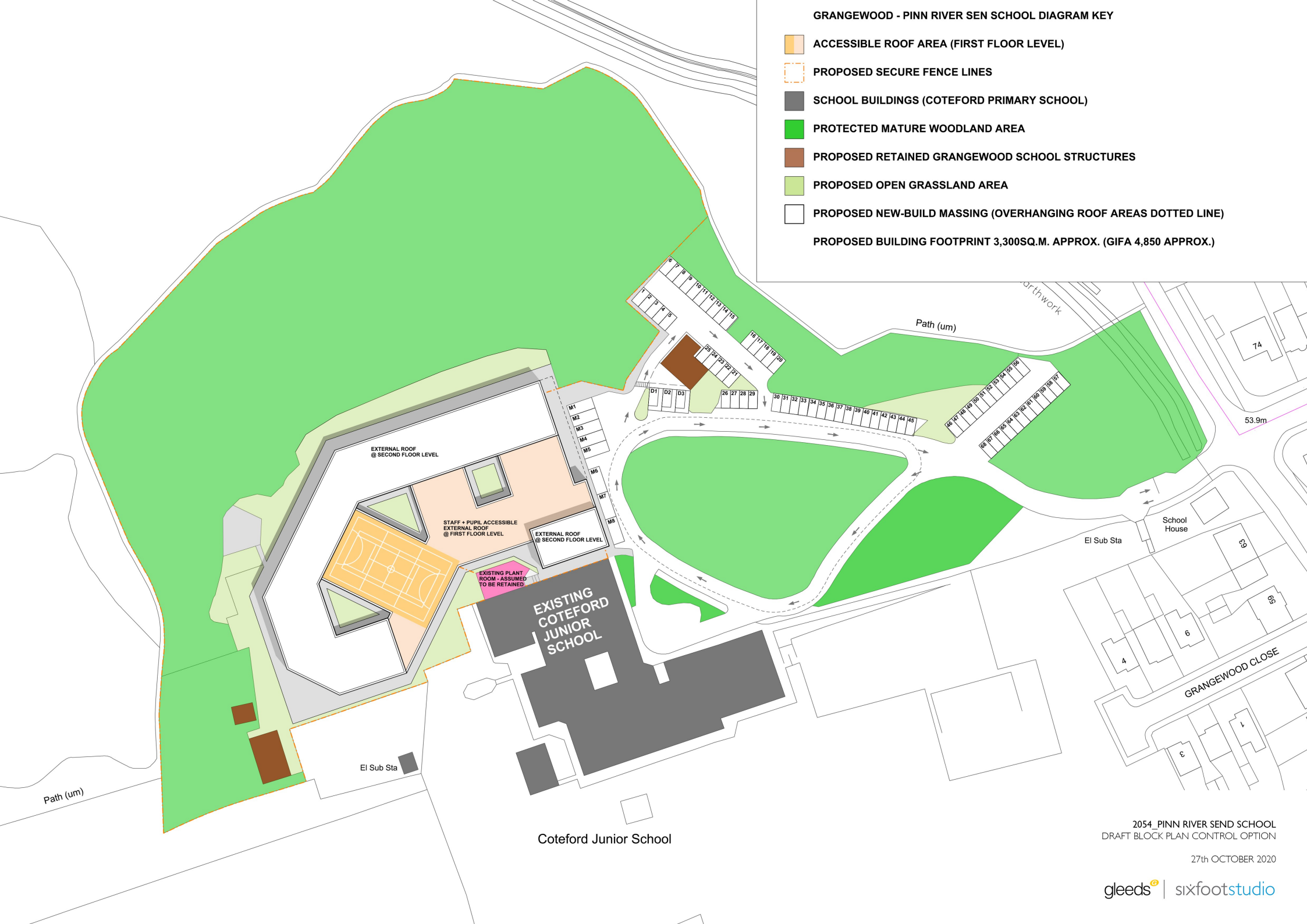
Appendix I



2054_PINN RIVER SEND SCHOOL
DRAFT BLOCK PLAN CONTROL OPTION

27th OCTOBER 2020

gleeds | sixfootstudio

Appendix II

Borehole Log

Borehole No. **WS1**

Sheet 1 of 1

Project Name: Grangewood Primary School	Project No. C2734	Co-ords: 509931.60 - 188873.67	Hole Type WS
Location: Fore Street, Pinner		Level:	Scale 1:50
Client: Gleeds Advisory Ltd		Dates: 21/03/2018 - 21/03/2018	Logged By LAB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.12			Grass overlying brown TOPSOIL.
		1.00		N=13 (1,2/2,3,4,4)	0.90			MADE GROUND - Light brown very sandy very gravelly clay. Sand is fine to medium. Gravel is coarse to medium sub angular to sub rounded of flint and occasional limestone.
		2.00		N=28 (4,4/5,6,8,9)				Stiff brown green grey sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is rounded to sub rounded of mixed lithologies.
		3.00		N=30 (4,5/6,6,8,10)	2.60			Stiff brown green grey very sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is rounded to sub rounded of mixed lithologies.
		4.00		N=20 (3,3/4,5,5,6)	3.90			Stiff brown green grey very sandy silty CLAY. Sand is fine to medium.
		5.00		N=18 (4,3/4,4,5,5)	5.00			End of borehole at 5.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS2**

Sheet 1 of 1

Project Name: Grangewood Primary School	Project No. C2734	Co-ords: 509890.75 - 188839.41	Hole Type WS
Location: Fore Street, Pinner		Level:	Scale 1:50
Client: Gleeds Advisory Ltd		Dates: 21/03/2018 - 21/03/2018	Logged By LAB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30 - 0.40	ES		0.03			MADE GROUND - Wearing course.
					0.07			MADE GROUND - Base course.
					0.17			MADE GROUND - Sub base material .
								Stiff to very stiff brown green and grey mottled sandy CLAY. Sand is fine to medium.
		1.00		N=24 (3,3/4,6,7,7)	0.90			Stiff brown grey orange very sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is sub rounded to rounded of flint.
		1.70 - 2.00	B					
		2.00		N=25 (3,5/5,6,6,8)				
		3.00		50 (25 for 135mm/50 for 265mm)	3.00			End of borehole at 3.00 m
		3.10 - 3.20	TJ					

Remarks

Borehole Log

Borehole No. **WS3**

Sheet 1 of 1

Project Name: Grangewood Primary School	Project No. C2734	Co-ords: 509877.38 - 188816.87	Hole Type WS
Location: Fore Street, Pinner		Level:	Scale 1:50
Client: Gleeds Advisory Ltd		Dates: 21/03/2018 - 21/03/2018	Logged By LAB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25 - 0.35	ES		0.20			Grass overlying brown clayey TOPSOIL with occasional rootlets.
					0.80			Firm brown grey mottled slightly sandy CLAY with occasional rootlets. Sand is fine to medium.
		1.00		N=24 (3,3/4,6,7,7)				Stiff brown grey sandy slightly gravelly CLAY. Sand is fine to medium.
		1.90 - 2.00 2.00	TJ	N=30 (4,5/6,6,8,10)				
		3.00		N=24 (3,4/4,6,6,8)	3.10			Firm brown grey very sandy slightly silty CLAY. Sand is fine to medium.
		4.00		N=16 (3,4/4,4,4,4)				
		5.00		N=17 (3,3/3,4,5,5)	5.00			End of borehole at 5.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS4**

Sheet 1 of 1

Project Name: Grangewood Primary School	Project No. C2734	Co-ords: -	Hole Type WS
Location: Fore Street, Pinner		Level:	Scale 1:50
Client: Gleeds Advisory Ltd		Dates: 21/03/2018 - 21/03/2018	Logged By LAB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25 - 0.35	ES		0.15			Grass overlying brown sandy clayey TOPSOIL with many rootlets.
		1.00		N=10 (1,2/1,3,3,3)				Firm brown grey and orange mottled slightly sandy CLAY with fibrous roots. Sand is fine to medium.
		1.50 - 1.60	TJ		1.40			Stiff brown grey and green sandy CLAY. Sand is fine to medium.
		2.00		N=30 (4,4/6,8,10)				
		2.90 - 3.00	TJ					
		3.00		N=15 (3,2/3,4,4,4)				
		4.00		N=15 (3,3/3,3,4,5)	3.90			Firm brown green very sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is sub rounded to rounded of mixed lithologies.
		5.00		N=17 (3,3/3,4,5,5)	5.00			End of borehole at 5.00 m

Remarks

AGS

Borehole Log

Borehole No. **WS5**

Sheet 1 of 1

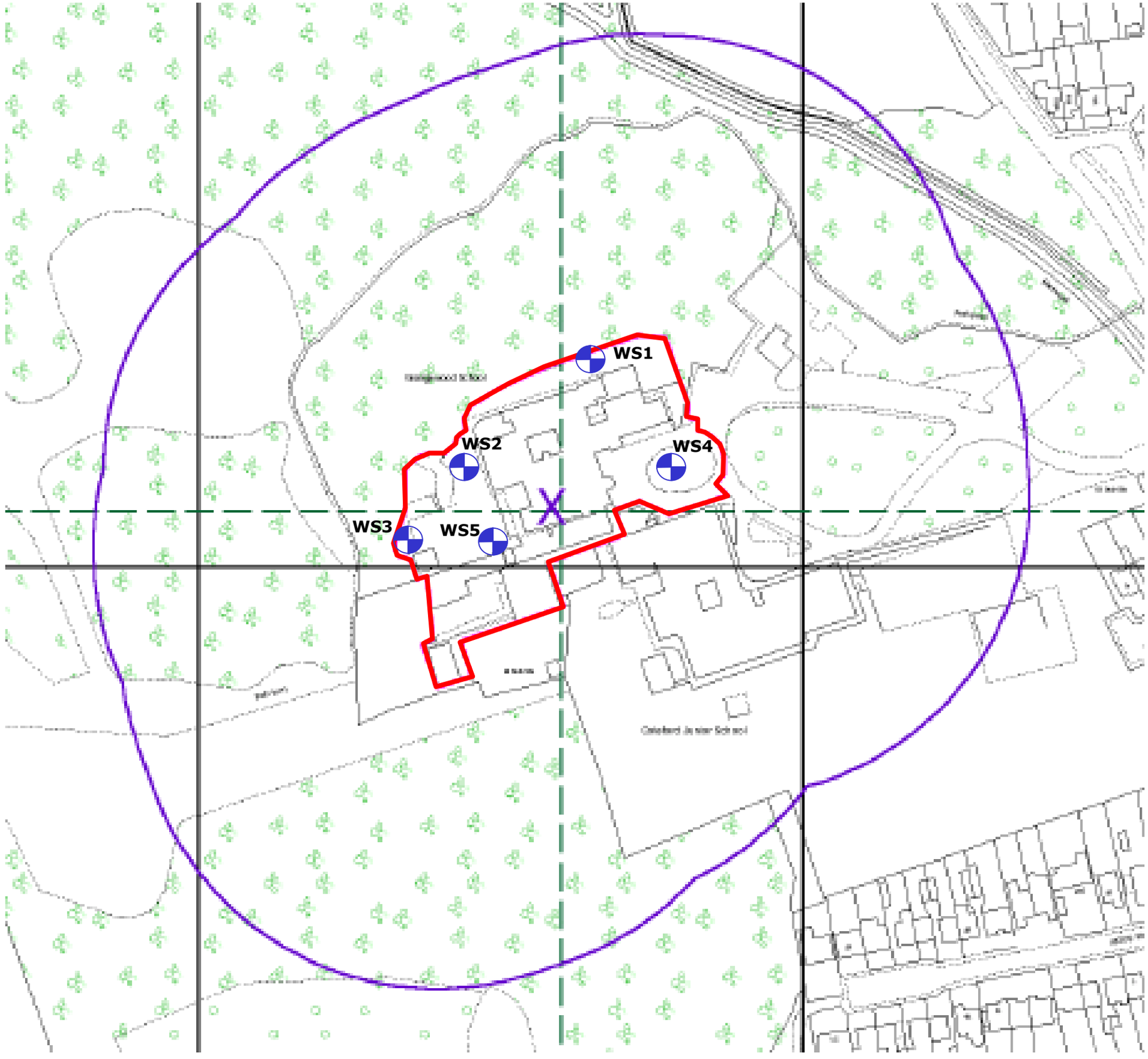
Project Name: Grangewood Primary School	Project No. C2734	Co-ords: 509905.09 - 188817.47	Hole Type WS
Location: Fore Street, Pinner		Level:	Scale 1:50
Client: Gleeds Advisory Ltd		Dates: 21/03/2018 - 21/03/2018	Logged By LAB

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.03			MADE GROUND - Wearing course.
					0.08			MADE GROUND - Base course.
		0.35 - 0.45	ES					MADE GROUND - Brown sandy very gravelly clay. Sand is fine to medium. Gravel is sub angular to sub rounded of brick, concrete and flint.
					0.85			Firm brown grey mottled sandy CLAY. Sand is fine to medium.
		1.00		N=9 (1,2/2,2,2,3)				
		1.50 - 1.60	TJ					
					1.70			Stiff brown grey mottled CLAY.
		2.00		N=9 (2,2/2,2,2,3)				
		2.30 - 2.40	TJ					
		3.00		N=14 (3,2/3,4,3,4)				
					3.40			Stiff brown grey mottled sandy CLAY. Sand is fine to medium.
		4.00		N=14 (3,4/3,3,4,4)				
		4.20 - 4.30	TJ					
		5.00		N=18 (3,3/3,4,5,6)	5.00			End of borehole at 5.00 m

Remarks

AGS

Appendix III



DO NOT SCALE

NOTES:

Scale approximate only

Do not scale

Window sampling borehole location

hsp consulting

Lawrence House, Meadowbank Way,
Eastwood, Nottingham, NG16 3SB
Tel: 0870 600 6090 Fax: 0870 600 6091
www.hspconsulting.com

CLIENT:

Gleeds Management Service Ltd

PROJECT:

Grangewood School,
Fore Street, Pinner

TITLE:

Site Investigation Layout Plan

SCALE@SIZE:	ISSUE:
NTS	FINAL
DESIGN/DRAWN : DRS	DATE: April 2018
PROJECT No: C2734	DRAWING No: 502

Appendix IV

LABORATORY REPORT

4043

Contract Number: PSL18/1951

Report Date: 04 May 2018

Client's Reference: C2734

Client Name: HSP Consulting
Lawrence House
4 Meadowbank Way
Eastwood
Nottingham
NG16 3SB

For the attention of: Luke Bradley

Contract Title: Grangewood

Date Received: 26/4/2018
Date Commenced: 26/4/2018
Date Completed: 4/5/2018

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

L Knight (Senior Technician)
S Eyre (Senior Technician)
A Fry (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS2		D	1.70		Brown slightly gravelly slightly sandy CLAY.
WS3		D	1.90		Brown slightly gravelly slightly sandy CLAY.
WS4		D	1.50		Brown slightly gravelly slightly sandy CLAY.
WS5		D	4.20		Brown slightly gravelly sandy CLAY.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Grangewood	Contract No: PSL18/1951 Client Ref: C2734

SUMMARY OF SOIL CLASSIFICATION TESTS

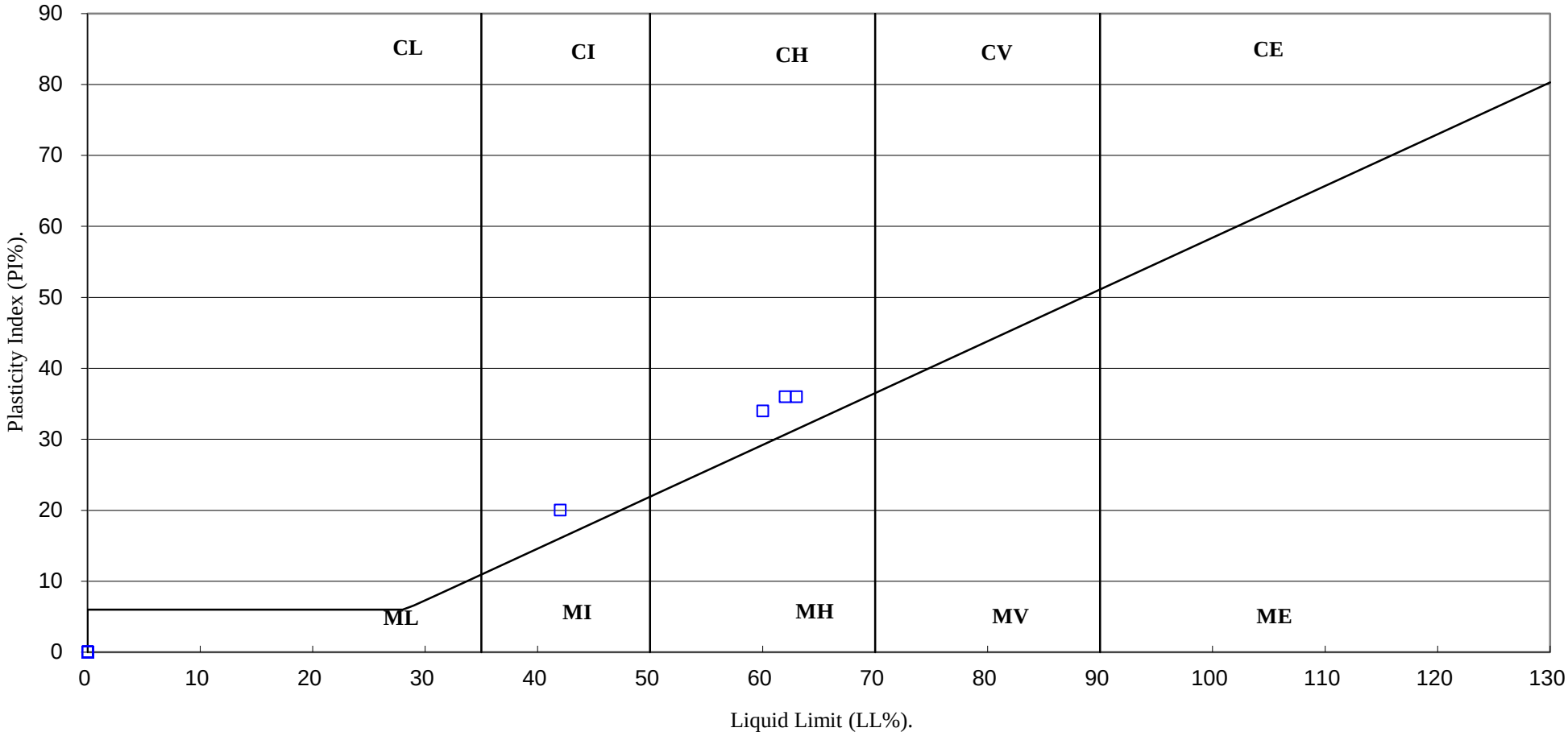
(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS2		D	1.70		17			62	26	36	92	High plasticity CH.
WS3		D	1.90		17			63	27	36	96	High plasticity CH.
WS4		D	1.50		21			60	26	34	93	High plasticity CH.
WS5		D	4.20		23			42	22	20	90	Intermediate plasticity CI.

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Grangewood**	**Contract No:** PSL18/1951 **Client Ref:** C2734

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	**Grangewood**	**Contract No:**
			PSL18/1951
			Client Ref:
			C2734

Appendix V

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

Final Report

Report No.:	18-08206-1
Initial Date of Issue:	29-Mar-2018
Client	HSP Consulting Engineers Limited
Client Address:	Lawrence House Meadowbank Way Eastwood Nottinghamshire NG16 3SB
Contact(s):	Linden Baker
Project	C2734 Grangewood
Quotation No.:	Q14-00343
Order No.:	
No. of Samples:	5
Turnaround (Wkdays):	4
Date Approved:	29-Mar-2018
Approved By:	
Details:	Glynn Harvey, Laboratory Manager

Date Received:	26-Mar-2018
Date Instructed:	26-Mar-2018
Results Due:	29-Mar-2018

Chemtest
The right chemistry to deliver results

Results - Soil

Project: C2734 Grangewood

Client: HSP Consulting Engineers Limited					**Chemtest Job No.:**	18-08206	18-08206	18-08206	18-08206
Quotation No.: Q14-00343					**Chemtest Sample ID.:**	597207	597208	597209	597210	597211
Order No.:					Client Sample Ref.:	WS1	WS2	WS3	WS4	WS5
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.40	0.30	0.25	0.25	0.35
					Bottom Depth (m):	0.50	0.40	0.35	0.35	0.45
					Date Sampled:	21-Mar-2018	21-Mar-2018	21-Mar-2018	21-Mar-2018	21-Mar-2018
					Asbestos Lab:	COVENTRY			COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A		-			-	-
Asbestos Identification	U	2192	%	0.001		No Asbestos Detected			No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020		11	17	23	18	15
pH	U	2010		N/A		4.9	8.2	7.2	7.0	8.4
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		< 0.40	< 0.40	< 0.40	< 0.40	0.48
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	0.11
Total Sulphur	U	2175	%	0.010		0.027		0.019	0.016	
Sulphur (Elemental)	U	2180	mg/kg	1.0		3.0	< 1.0	1.0	< 1.0	25
Cyanide (Free)	U	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	U	2325	mg/kg	0.50		2.1	4.9	1.4	1.1	8.3
Sulphate (Acid Soluble)	U	2430	%	0.010		0.047		0.016	< 0.010	
Arsenic	U	2450	mg/kg	1.0		72	12	17	15	7.8
Cadmium	U	2450	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	0.17
Chromium	U	2450	mg/kg	1.0		42	31	41	30	26
Copper	U	2450	mg/kg	0.50		37	26	29	11	19
Mercury	U	2450	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50		43	43	29	16	26
Lead	U	2450	mg/kg	0.50		23	17	26	19	23
Selenium	U	2450	mg/kg	0.20		0.72	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50		84	130	94	60	79
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40			0.47		1.5	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chemtest
The right chemistry to deliver results

Results - Soil

Project: C2734 Grangewood

Client: HSP Consulting Engineers Limited			**Chemtest Job No.:**		18-08206	18-08206	18-08206	18-08206	18-08206
Quotation No.: Q14-00343			**Chemtest Sample ID.:**		597207	597208	597209	597210	597211
Order No.:			Client Sample Ref.:		WS1	WS2	WS3	WS4	WS5
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.30	0.25	0.25	0.35
			Bottom Depth (m):		0.50	0.40	0.35	0.35	0.45
			Date Sampled:		21-Mar-2018	21-Mar-2018	21-Mar-2018	21-Mar-2018	21-Mar-2018
			Asbestos Lab:		COVENTRY			COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.15	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.17	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.4	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.39	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.7	< 0.10	0.18
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.8	< 0.10	0.21
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.94	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.83	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.64	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.38	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.66	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.31	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.32	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	9.9	< 2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
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
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.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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"

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 45 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.co.uk

Appendix VI

HazWasteOnline™

Waste Classification Report

L7Y5Y-JBRGK-UUL8P

Job name

C2734 - Grangewood School, Pinner

Description/Comments

Project

C2734 - Grangewood School

Site

Grangewood School, Pinner

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Luke Bradley
Date:
4/24/2018 1:45:58 PM UTC
Telephone:
01773 535555

Company:
HSP Consulting
Lawrence House
4 Meadowbank Way, Eastwood
Nottingham
NG16 3SB

Report

Created by: Luke Bradley
Created date: 4/24/2018 13:45 UTC

Job summary

Classification of sample: WS1-597207-21/03/2018-0.40

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

Sample details

Sample Name:
WS1-597207-21/03/2018-0.40
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	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 trioxide }	033-003-00-0	215-481-4	1327-53-3		72 mg/kg	1.32	84.606 mg/kg	0.00846 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		42 mg/kg	1.462	54.633 mg/kg	0.00546 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37 mg/kg	1.126	37.076 mg/kg	0.00371 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	23 mg/kg	1.56	31.929 mg/kg	0.00205 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		43 mg/kg	2.976	113.902 mg/kg	0.0114 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.72 mg/kg	2.554	1.636 mg/kg	0.000164 %	✓	
11	zinc { zinc chromate }	024-007-00-3				84 mg/kg	2.774	207.395 mg/kg	0.0207 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				4.9	pH		4.9	pH	4.9 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				3	mg/kg		2.67	mg/kg	0.000267 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0537 %		

Key

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

Classification of sample: WS2-597208-21/03/2018-0.30

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

Sample details

Sample Name:
WS2-597208-21/03/2018-0.30
Moisture content:
17%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand	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 trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	13.15 mg/kg	0.00132 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		31 mg/kg	1.462	37.606 mg/kg	0.00376 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26 mg/kg	1.126	24.297 mg/kg	0.00243 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17 mg/kg	1.56	22.009 mg/kg	0.00141 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		43 mg/kg	2.976	106.223 mg/kg	0.0106 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3				130 mg/kg	2.774	299.33 mg/kg	0.0299 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0511 %		

Key

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

Classification of sample: WS3-597209-21/03/2018-0.25

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

Sample details

Sample Name:
WS3-597209-21/03/2018-0.25
Moisture content:
23%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#	Determinand	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 trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	17.283 mg/kg	0.00173 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		41 mg/kg	1.462	46.141 mg/kg	0.00461 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		29 mg/kg	1.126	25.141 mg/kg	0.00251 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	26 mg/kg	1.56	31.227 mg/kg	0.002 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		29 mg/kg	2.976	66.46 mg/kg	0.00665 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3				94 mg/kg	2.774	200.793 mg/kg	0.0201 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				7.2	pH		7.2	pH	7.2 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				0.15	mg/kg		0.115	mg/kg	0.0000115 %	✓	
			205-917-1	208-96-8									
22		acenaphthene				0.17	mg/kg		0.131	mg/kg	0.0000131 %	✓	
			201-469-6	83-32-9									
23		fluorene				0.12	mg/kg		0.0924	mg/kg	0.00000924 %	✓	
			201-695-5	86-73-7									
24		phenanthrene				1.4	mg/kg		1.078	mg/kg	0.000108 %	✓	
			201-581-5	85-01-8									
25		anthracene				0.39	mg/kg		0.3	mg/kg	0.00003 %	✓	
			204-371-1	120-12-7									
26		fluoranthene				1.7	mg/kg		1.309	mg/kg	0.000131 %	✓	
			205-912-4	206-44-0									
27		pyrene				1.8	mg/kg		1.386	mg/kg	0.000139 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.94	mg/kg		0.724	mg/kg	0.0000724 %	✓	
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.83	mg/kg		0.639	mg/kg	0.0000639 %	✓	
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.64	mg/kg		0.493	mg/kg	0.0000493 %	✓	
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.38	mg/kg		0.293	mg/kg	0.0000293 %	✓	
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.66	mg/kg		0.508	mg/kg	0.0000508 %	✓	
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				0.31	mg/kg		0.239	mg/kg	0.0000239 %	✓	
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.12	mg/kg		0.0924	mg/kg	0.00000924 %	✓	
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				0.32	mg/kg		0.246	mg/kg	0.0000246 %	✓	
			205-883-8	191-24-2									
36		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0399 %		

Key

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

Classification of sample: WS4-597210-21/03/2018-0.25

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

Sample details

Sample Name:
WS4-597210-21/03/2018-0.25
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	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 trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	16.24 mg/kg	0.00162 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30 mg/kg	1.462	35.954 mg/kg	0.0036 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11 mg/kg	1.126	10.156 mg/kg	0.00102 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	19 mg/kg	1.56	24.302 mg/kg	0.00156 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16 mg/kg	2.976	39.049 mg/kg	0.0039 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3				60 mg/kg	2.774	136.488 mg/kg	0.0136 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				7	pH		7	pH	7pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.027 %		

Key

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

Classification of sample: WS5-597211-21/03/2018-0.35

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

Sample details

Sample Name:
WS5-597211-21/03/2018-0.35
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand	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 trioxide }	033-003-00-0	215-481-4	1327-53-3		7.8 mg/kg	1.32	8.754 mg/kg	0.000875 %	✓	
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.48 mg/kg	3.22	1.314 mg/kg	0.000131 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.17 mg/kg	1.142	0.165 mg/kg	0.0000165 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		26 mg/kg	1.462	32.3 mg/kg	0.00323 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19 mg/kg	1.126	18.183 mg/kg	0.00182 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	23 mg/kg	1.56	30.494 mg/kg	0.00196 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		26 mg/kg	2.976	65.775 mg/kg	0.00658 %	✓	
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3				79 mg/kg	2.774	186.284 mg/kg	0.0186 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
		006-007-00-5											
19		pH				8.4	pH		8.4	pH	8.4 pH		
				PH									
20		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				0.18	mg/kg		0.153	mg/kg	0.0000153 %	✓	
			205-912-4	206-44-0									
27		pyrene				0.21	mg/kg		0.179	mg/kg	0.0000179 %	✓	
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
36		sulfur { sulfur }				25	mg/kg		21.25	mg/kg	0.00213 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0368 %		

Key

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

Appendix A: Classifier defined and non CLP determinands

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

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 7/17/2015
Risk Phrases: R61 , R60 , R50/53 , R43 , R42 , R38 , R37 , R36 , R22 , R20
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

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

CLP index number: 029-002-00-X
Description/Comments: M-factor for long-term aquatic hazard not included as per paragraph (5), ATP9
Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)
Additional Risk Phrases: N R50/53 >= 0.25 %, N R50/53
Additional Hazard Statement(s): None.
Reason for additional Hazards Statement(s)/Risk Phrase(s):
10/10/2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases
10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

- **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: 5/25/2015
Risk Phrases: R65 , R63 , R51/53 , R46 , R45 , R10
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
6/3/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Risk Phrases: None.
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s)/Risk Phrase(s):
12/14/2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

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

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 5/25/2015
Risk Phrases: None.
Hazard Statements: None.

- **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: 7/17/2015
Risk Phrases: R38 , R37 , R36 , R27 , R26 , R22
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 7/17/2015
Risk Phrases: N R51/53 , N R50/53 , R38 , R37 , R36
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 8/6/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 8/6/2015
Risk Phrases: N R50/53 , R43 , R40 , R38 , R37 , R36 , R22
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 7/17/2015
Risk Phrases: N R50/53 , R43 , R38 , R37 , R36
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 8/21/2015
Risk Phrases: N R50/53 , Xn R22
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 8/21/2015
Risk Phrases: N R50/53 , Xi R36/37/38
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 8/6/2015
Risk Phrases: R40
Hazard Statements: Carc. 2 H351

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 7/23/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

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

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

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

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

sulfur {sulfur}

Elemental sulfur most likely to be worst case scenario hazardous

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015
HazWasteOnline Classification Engine Version: 2018.109.3526.7205 (19 Apr 2018)
HazWasteOnline Database: 2018.109.3526.7205 (19 Apr 2018)

This classification utilises the following guidance and legislation:
WM3 - Waste Classification - May 2015
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Appendix VII

CLEA Software Version 1.071

Report generated	10/05/2018
Report title	Grangewood School, Pinner
Created by	Luke Bradley at HSP Consulting

BASIC SETTINGS

Land Use	Residential without produce (C4SL)						
Building	Office (post 1970)						
Receptor	Female (res C4SL)	Start age class	4	End age class	16	Exposure Duration	13 years
Soil	Sandy loam						

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✖	Inhalation of indoor dust	✖
Consumption of homegrown produce	✖	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✖			Inhalation of indoor vapour	✖
				Inhalation of outdoor vapour	✖

Environment Agency

Land Use Residential without produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^{2})		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^{3} day^{-1})	Max exposed skin factor		Total skin area (m^{2})
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^{2} m^{-2})	Outdoor (m^{2} m^{-2})	
1	**0**	0	**0**	**0**	**0**	**0**	**0.0**	**0.0**	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	**0**	0	**0**	**0**	**0**	**0**	**0.0**	**0.0**	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	**0**	0	**0**	**0**	**0**	**0**	**0.0**	**0.0**	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	**180**	0	**0**	**180**	**0**	**180**	**8.0**	**2.0**	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	**180**	0	**0**	**180**	**0**	**180**	**8.0**	**2.0**	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	**180**	0	**0**	**180**	**0**	**180**	**8.0**	**2.0**	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	**180**	0	0	**180**	0	**180**	**8.0**	**2.0**	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Office (post 1970)

Soil Sandy loam

Building footprint (m^2)	6.10E+02
Living space air exchange rate (hr^{-1})	1.00E+00
Living space height (above ground, m)	1.28E+01
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	5.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	1.98E+03
Dust loading factor (µg m^{-3})	1.00E+02

Porosity, Total (cm^3 cm^{-3})	5.30E-01
Porosity, Air-Filled (cm^3 cm^{-3})	2.00E-01
Porosity, Water-Filled (cm^3 cm^{-3})	3.30E-01
Residual soil water content (cm^3 cm^{-3})	1.20E-01
Saturated hydraulic conductivity (cm s^{-1})	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density (g cm^{-3})	1.21E+00
Threshold value of wind speed at 10m (m s^{-1})	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.80E+00
Soil Organic Matter content (%)	1.16E+00
Fraction of organic carbon (g g^{-1})	6.73E-03
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($cm^3\ s^{-1}$)	1.50E+02
Building ventilation rate ($cm^3\ s^{-1}$)	2.17E+06
Averaging time surface emissions (yr)	13
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m ($m\ s^{-1}$)		5.00
Air dispersion factor at height of 0.8m *		2400.00
Air dispersion factor at height of 1.6m *		0.00
Fraction of site cover ($m^2\ m^{-2}$)		0.75

* Air dispersion factor in $g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	$g\ DW\ g^{-1}\ FW$	dimensionless		$g\ g^{-1}\ DW$	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

CLEA Software Version 1.071

Report generated	10-May-18
Report title	Grangewood School, Pinner
Created by	Luke Bradley at HSP Consulting

RESULTS

CLEA Software Version 1.071 Report generated 10-May-18

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50%
		oral	inhalation	combined	oral	inhalation	combined		Oral
1	Arsenic	4.40E+02	2.72E+05	NR	1.00	0.00	NR	NR	No
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

rule? Inhal	Top Two applied?	Apply Top 2 Approach to Produce Group: Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
No	Yes	No	No	No	No	No	No

CLEA Software Version 1.071 Report generated 10-May-18 P

Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})
	oral	inhalation	combined	oral	inhalation	combined	
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit

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Environment Agency

		Soil Distribution				Media Concentra							
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
1	Arsenic	99.9	0.1	0.0	100.0	4.40E+02	NR	NA	1.87E-07	0.00E+00	NA	NA	NA
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

ations

Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
NA	NA	NA	NA	NA	NA

CLEA Software Version 1.071 Report generated 10-May-18

Environment Agency

	Soil Distribution				Media Concentrat							
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

ions

Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW

CLEA Software Version 1.071 Report generated 10-May-18

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distr		
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust
1	Arsenic	2.94E-04	0.00E+00	5.67E-06	3.24E-09	0.00E+00	0.00E+00	0.00E+00	98.11	0.00	1.89
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

ibution by Pathway (%)

Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
0.00	0.00	0.00	0.00	0.00

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Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution b			
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

y Pathway (%)

Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)

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Environment Agency

		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	0.03
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
0.5	1	1	1

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Environment Agency

	Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)

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Environment Agency

		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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17							
18							
19							
20							

Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
0.00033 fw	0.0002 fw	0.0011 fw

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	Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility ($mg L^{-1}$)	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)