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PHASE 2

ENVIRONMENTAL REPORT

job number	C2405/24/E/6623
date	04.06.2024
site address	15 Halifax Road, Scapegoat Hill, Huddersfield, West Yorkshire, HD7 4NS
written by	S. Hale
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Contents

Appendices

Report on a Phase 2 Environmental Investigation

Location:	15 Halifax Road Scapegoat Hill, Huddersfield, West Yorkshire, HD7 4NS
For:	John Holmes
Report No.	C2405/24/E/6623 Report date: June 2024

For and on behalf of **Rogers Geotechnical Services Ltd**

Steven Hale BSc FGS Geo-environmental Technician	**Rob Palmer** MSc FGS ACIEH Engineering Director

Report Summary[1]

Item	Comments	Section
Development	Demolition of the existing garage followed by the erection of a new garage in the same footprint. A new agricultural building shall be constructed in a field to the west.	1.
Geology	Solid Geology – Rough Rock	5.
Strata Conditions	Made ground topsoil overlying reworked sandstone gravel at TP01 and TP02. Topsoil overlying sandstone of the Rough Rock at TP03 and TP04.	6.1
Groundwater	None encountered during investigation.	6.2
Contamination	Lead contamination to TP01 and TP02 within made ground.	9.1.1
Effect of Sulphates	DC-1	9.1.3

[1] This summary should not be relied upon to provide a comprehensive review. All of the information contained in this document should be considered.

1. Introduction

It is understood that the land at 15 Halifax Road, Huddersfield is to be developed by the demolition of the existing garage followed by the erection of a new garage in the same footprint. A new agricultural building shall be constructed in a field to the west. Consequently, a site investigation has been undertaken in accordance with the instruction from the client. This work was required in order to determine the nature of the underlying soils and to take into consideration the risk of any contamination present. This report describes the work undertaken, presents the data obtained and discusses the ground conditions in relation to the proposed works.

2. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of the laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between borehole positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

3. Desk Study

A Phase 1 Desk Study has been undertaken by Rogers Geotechnical Services (RGS) and the results were presented as report number C2405/22/E/3675 in April 2024. This report has been used extensively during the current intrusive investigation.

It should be appreciated that the historical appraisal in the desk study indicated that a quarry was present to the eastern part of the site where the current garage and residential dwelling are located with another quarry located across the road to the east. These quarries were noted to all have been backfilled approximately 50 years.

4. Fieldworks

The fieldworks were undertaken on the 8th May 2024 and included four trial pits excavated by the client utilising a tracked mini-digger. The investigatory locations are shown on the site plan which is presented in Appendix 1 to this report.

4.1 Machine-Dug Trial Pits

A total of four trial pits were excavated in order to reveal the nature of the near surface soils using an excavator provided by the client. The soils were logged on site in general accordance with BS5930: 2015+A1: 2020, and full descriptions are given on the trial pit records which are presented in Appendix 2. At regular intervals throughout the excavation of the pits. The test specimens were

retained in the appropriate air tight containers within cool boxes for onward transition to the chemical laboratory.

Once excavations were completed, the trialpits were carefully re-instated with the arisings. Whilst every care was taken during the infilling process, including compacting of the infill at regular intervals with the arm of the excavator, it should be appreciated that some mounding of the surface may have resulted. Moreover, the infilled soils may be subjected to settlement over time, such that a depression in the surface may also occur. Therefore, the locations of any pits undertaken in this investigation should be conveyed to the current site user, as the mounds or depressions associated with the pits may present a risk to current site operations e.g. livestock or agricultural plant equipment. Furthermore, it must be realised that the infilled pits represent an area of disturbance within the site soils, thus the soils at the pit locations may vary characteristically compared to the undisturbed ground. As such, foundations placed in this disturbed material may not perform as anticipated.

5. Geology

The available published geological data for the site has been examined and the following table presents the anticipated geology.

Table 1: Geological Data for the Site

Strata Type	Strata Name[2]	Previous Name[3]	Description[3]
Superficial Geology	N/A	N/A	Not indicated to underlie the site.
Solid Geology	Rough Rock	Rough Rock Formation	Coarse-grained feldspathic sandstone, cross-bedded.

6. Strata Conditions

In accordance with the geology of the area, the succession has been shown to include the following:

Table 2: Generalised Strata Profile

Depth m below ground level to underside of layer	**Strata Type**	**Positions Encountered**	**Groundwater Strikes** m below ground level
0.20 – 0.30	MADE GROUND (Soft, dark brown, slightly sandy, slightly gravelly SILT).	TP01 & TP02	None
0.35 – 0.50	TOPSOIL. (Dark brown, slightly sandy, slightly gravelly SILT).	TP03 & TP04	None
+1.50	MADE GROUND – QUARRY FILL (Yellowish brown, silty, sandy GRAVEL of sandstone with moderate cobble content).	TP01 & TP02	None

[2] Sources: British Geological Survey (NERC) Map Sheet 77; Huddersfield; Solid and Drift Edition, and Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
[3] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

+0.60 – +0.70	ROUGH ROCK (Yellowish brown SANDSTONE recovered as a sandy gravel)	TP03 & TP04	None

'+' denotes that the strata extended below the termination depth of the investigated positions, thus the extent of the deposit is only proven to the depths indicated

6.1 General Strata

In general, the investigation has revealed that the site can be broadly separated into two main sections. The area local to TP01 and TP02 where made ground comprising silt was proven to overlie quarry backfill proven to a depth of 1.50m below existing ground level (begl), and the area local to TP03 and TP04 where topsoil was proven directly overlying sandstone to depths between 0.60m and 0.70m begl.

These records broadly correlate with the geological and historical records of the site whereby a quarry was recorded on part of the site between the years of 1892 and 1908. The sandstone likely represents the Rough Rock noted to underly the site according to the published geological records of the area. It was noted that the made ground i.e. quarry fill comprised materials typical of quarry spoil. This would suggest that the quarry has been backfilled with quarry waste, as opposed to general waste imported from off-site.

6.2 Groundwater

No groundwater strikes were observed during the site investigation. It should be appreciated that the normal rate of boring does not permit the recording of an equilibrium water level for any one strike, moreover, groundwater levels are subject to seasonal variation or changes on local drainage conditions.

7. Laboratory Testing - Environmental

A suite of testing was conducted on samples from across the site and the following regime was undertaken.

- Metals – Cd, Cr(VI), Cu, Hg, Ni, Pb, V and Zn.
- Semi and Non-Metals - As, Se, Free CN^-.
- Polycyclic aromatic hydrocarbons (PAHs).
- Others – pH, organic content and total/soluble SO_4^{2-}.
- Asbestos.

This testing was undertaken by i2 Analytical and the results of all of the chemical testing are presented in Appendix 3 of this report.

8. Discussion of Ground Conditions - Environmental

8.1 Discussion of Test Results

It is understood that the site is to be developed by the demolition of the existing garage followed by the erection of a new garage in the same footprint. Moreover, an agricultural building is to be constructed in field to the west of the site. Consequently, the site may be classified as residential

without plant uptake, albeit screening values for a commercial end use have also been considered for the agricultural building.

8.1.1 Soil Samples

The results of the chemical testing undertaken on soil samples obtained during this investigation have been compared to the ATRISK soil screening values (SSVs) as compiled by WS Atkins plc. With respect to the results it should be appreciated that the soil organic matter (SOM) content for the samples tested was found to range between 4.8% and 7.5%. On this basis, it is considered that the screening values associated with 6% SOM should be adopted. These values have been derived in such a way as to adhere to the principles within the revised CLEA model and include the most current release of the SGVs. A list of subscribers is provided within the website[4] and these include many local authorities.

A comparison of the results of the testing, together with the data given above, can be found within Appendix 4. These results indicate the following:

Table 3: Summary of Contaminated Areas

Location	Strata	Depth (m)	Contaminants found to be exceeding SSVs (Residential without plant uptake)
TP01	Made Ground	0 – 0.30	Lead PAHs: Indeno(1,2,3-c,d)Pyrene & Benzo(g,h,i)perylene
TP02	Made Ground	0 – 0.20	Lead PAHs: Indeno(1,2,3-c,d)Pyrene
TP04	Topsoil	0 – 0.35	PAHs: Dibenz(a,h)Anthracene & Benzo(g,h,i)perylene

Concentrations of cadmium, chromium(VI), selenium and Cyanide (free) were below the detection limits for the tests. Detectable levels of all other contaminants were recorded, but these fell below the associated Atrisk Soil Screening Values. In addition, no asbestos was detected within the soil samples tested.

It should be appreciated that the soil screening values for PAHs and TPHs (where appropriate) represents vapour saturation limits. The inhalation of vapour pathway contributes less than 10% of total exposure, which is unlikely to significantly affect the combined assessment criterion[5]. In view of this, the ATRISK soil SSVs notes that the users may wish to consider using a combined assessment criterion if free product is not observed, the values for which are also provided on the summary of contamination analysis. It is therefore considered that the criteria for no free product should be adopted for the PAHs and TPHs at this site. The results of the contaminants found to exceed these screening values are tabulated below:

Table 4: Summary of areas contaminated by PAHs & TPHs

Location	Strata	Depth (m)	Contaminants found to be exceeding SSVs (Residential without plant uptake)
TP01	Made Ground	0 – 0.30	None
TP02	Made Ground	0 – 0.20	None
TP04	Topsoil	0 – 0.35	None

[4] http://www.atrisksoil.co.uk/pages/general/subscribers.asp
[5] Ref: ATRISK soil, SSVs derived using CLEA v1.071 for 6% SOM, Residential without home grown produce land use, 23.06.17.

On the basis of the above information, the results of the investigation have concluded that the site is locally contaminated in the made ground at locations of TP01 and TP02 with respect to lead. It should be noted that these areas are external to the garage and do not form part of the garage footprint. These external areas are to remain as is and do not form part of the development itself, i.e. the construction of the garage building. Indeed, the source-pathway-receptor model shall not change. It should be further appreciated that no contamination was found to exceed screening values within the vicinity of the proposed agricultural building.

8.1.2 Effect of Sulphates

In view of the nature of the underlying soils it is considered that the design sulphate class be assessed with reference to Table C2[6], which is provided in BRE Special Digest 1, *Concrete in aggressive ground*: Part C. On the basis of this table and considering the soluble sulphate contents recorded, it can be shown that well compacted buried concrete should be designed in accordance with Class DS-1 requirements. Assuming mobile groundwater, the table also indicates that the aggressive chemical environment for concrete (ACEC) classification is AC-1.

In order to evaluate the design chemical (DC) class for the buried concrete at this site reference should be made to Table D1[7], which can be found in Part D, *Specifying concrete for general cast-in-situ use,* of BRE Special Digest 1. From this table it may be shown that for an intended working life of at least 50 years the concrete design class DC-1 is required.

8.1.3 Ground Gas

As highlighted in the desk study, it has become evident that part of the site is situated on a historic quarry. The desk study revealed that the quarries in the area were infilled over 50 years ago, and as such it wasn't deemed necessary for gas monitoring to be undertaken as peak generation was likely to have passed. Indeed, the quarries are relatively small and localised. Notwithstanding this, the desk study does outline that *'should a significant thickness of made ground or organic soils considered capable of producing harmful gases be revealed during the investigation works, a monitoring regime may be required.'* As discussed in section 6 above, the quarry fill present from 0.3m to 1.5m was found to comprise silty, sandy gravel with occasional cobbles of sandstone. Such soils are deemed unlikely to represent a significant source of ground gas. Therefore it is deemed that gas monitoring is not required.

8.2 Site Specific Risk Assessment

8.2.1 Approach

The presence of contamination hazards and the risks associated with them should be assessed in accordance with industry practice and the 'suitable for use' approach. This has been conducted with reference to The Department for Environment, Food and Rural Affairs (DEFRA) and The Environment Agency[8] advice on the assessment of risks arising from the presence of contamination in soils and using the source-pathway-receptor approach.[9] This method dictates that there must be a risk of contaminant produced at a 'source' in sufficient concentration to cause harm and there

[6] Table C2, *Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations*
[7] Table D1, *Selection of the DC Class and the number of APMs for concrete elements where the hydraulic gradient due to groundwater is 5 or less: for general in-situ use of concrete.*
[8] R&D Publication CLR 8, 'Assessment of Risks to Human Health from Land Contamination: An overview of the Development of Soil Guideline Values and Related Research'.
[9] The pollution linkage approach was developed by 'Circular 2/2000 Contaminated Land: Implementation of Part II of The Environmental Protection Act 1990' which provides meanings for the terms contained in The Environmental Protection Act 1990 Part IIA, the primary legislation for addressing the issues of contaminated land.

must be a 'pathway' for the contaminant to reach an identifiable 'receptor' for the linkage to be proved and a contamination hazard to be considered present. Not all substances are contaminants and not all contaminants are considered to be a risk. Indeed, DEFRA and The Environment Agency state that 'a contaminant is a substance which has the potential to cause harm, while a risk itself is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.'[10]

8.2.2 Conceptual Ground Model and Risk Assessment

In view of the results of the chemical testing undertaken the conceptual site model is presented accordingly as Table 5. Sources of contamination include the following:

On-site – Made Ground (Lead).

The preliminary risk assessment has been evaluated with reference to the following ratings and definitions:

N/A -	A source-pathway-receptor linkage is not considered to exist and therefore a risk assessment is not required.
Low -	A pollution linkage is unlikely and/or the likelihood of harm occurring is low and of minor consequence.
Moderate -	The linkage exists but the likelihood of harm occurring is not considered to be significant although remedial action may be necessary
High -	The linkage exists and the available data indicates that significant harm may be caused and remedial action could be necessary.

The results of the risk assessment are presented in Table 5.

[10] See 'Circular 2/2000 Contaminated Land: Implementation of Part II of The Environmental Protection Act 1990', appendix A.

Table 5: Conceptual Site Model and Site Specific Risk Assessment				
Conceptual Site Model			**Site Specific Risk Assessment**	
Pathways	**Receptor**	**Linkage Present?**	**Risk Rating**	**Notes**
Direct contact/dermal absorption/soil ingestion	Operative	Yes – lead contamination found to be present at the site within made ground and contact with soil likely during works.	Moderate	Lead contamination is present within the made ground underlying the site. Garage to be entirely hardstanding which will sever the pathway to end users'
	End User (Garage)	Yes – lead contamination found to be present at the site. Site to be entirely developed by hardstanding which will sever pathway to end users.	Low	
	End User (Agricultural Building)	Yes – contamination falls below appropriate screening levels.	Low	
	Neighbours	Yes – lead contamination found to be present and a residential property is adjacent to the site. However, lead is not expected to be significantly mobile.	Low	
Inhalation of Dust/Vapours	Operative	Yes – dust may be derived from contaminated soils. However, lead contamination is not considered likely to represent a significant dust/vapour risk.	Moderate (Dust) Low (Vapours)	Lead contamination is present within the made ground underlying the site. Garage to be entirely hardstanding which will sever the pathway to end users'
	End User (Garage)	Yes – dust may be derived from contaminated soils. However, lead contamination is not considered likely to represent a significant vapour risk.	Moderate (Dust) Low (Vapours)	
	End User (Agricultural Building)	Yes – contamination falls below appropriate screening levels.	Low	
	Neighbours	Yes – contamination found to be present at the site and residential and a residential property is adjacent to the site. Possible inhalation of dust during the works.	Moderate (Dust) Low (Vapours)	
Ingestion of fruit/vegetables and/or waters	Operative	No – no edible plants or contained water sources in the area of the proposed new works.	N/A	
	End User	No – development does not include soft landscapes areas.	N/A	

	Neighbours	Yes – lead contamination found to be present in made ground at the site and a residential property is adjacent to the site. However, lead contamination is not expected to be significantly mobile	Low	
Migration of hazardous gases via permeable strata or shallow mining activity	Operative	Yes – infilled quarry encountered beneath part of site. However, the soils do not appear to represent a generative source. Moreover, buildings are to be well ventilated.	Low	
	End User			
	Neighbours			
Spillage/loss/run off direct to receiving water	Controlled Waters	No – lead contamination found to be present at the site. However, no known controlled waters within 250m of the site and the contamination is not expected to be significantly mobile.	N/A	Lead contamination has is present in the soils underlying the site. Site to be entirely hardstanding which will sever the pathway to end users' Old services to be removed or capped.
Migration via permeable unsaturated strata	Controlled Waters	Yes – a secondary A aquifer is present beneath the site. However, the lead contamination is not expected to be significantly mobile.	Low	
Run off via drainage/sewers etc	Controlled Waters	Yes – old services may be present on site. However, the lead contamination is not expected to be significantly mobile.	Low	
Direct contact with contaminated soils	Plants	No – lead contamination found to be present at the site, however, no soft landscaping is present within the proposed development.	N/A	Site to be entirely hardstanding which will sever the pathway to end users'
Uptake via root system			N/A	
Direct contact with contaminated soils	Building Materials	Yes – traces of PAHs revealed at the site may represent a risk to building materials or plastic water pipes. Moreover, testing indicates that the aggressive chemical environment for concrete classification is AC-1.	Moderate (plastic services) Low (buried concrete)	Please see section 8.3.3 for information on good building practice.
Direct contact with contaminated groundwater				
Exposure to Radon	Operative	Yes – The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level).	Low	The publication BR211 states that no protection measures are necessary.
	End User			

8.3 Remediation Strategy

In view of the site-specific risk assessment it is considered that remediation will be required at this site. Such a strategy should include the following main elements.

It is anticipated that the contamination is localised to the made ground adjacent to the existing garage. It is anticipated that this contamination will either be fully removed from the site during an initial site strip, or will be wholly encapsulated by the construction of the new building. As discussed previously, any soft landscaped areas fall outside of the development area and the source-pathway-receptor model shall not change for these areas.

8.3.1 Remediation Objectives

Based on the site-specific risk assessment the object of the remediation is likely to be as follows.

- To protect the site operatives during the construction process from the ingestion of soil or dust, dermal contact with the soil and inhalation of dust.
- To protect the end user from the ingestion of soil or dust, dermal contact with the soil and inhalation of dust.
- To protect neighbours from the inhalation and ingestion dust during the construction process.
- To protect plastic services from being penetrated by, or degrading due to the presence of, contamination in the soil or groundwater.

8.3.2 Development Requirements

It is understood that the site is to be developed by the demolition of the existing garage followed by the erection of a new garage and agricultural building, as such, the following remediation proposals are offered.

8.3.3 Outline Strategy

In order to fulfil the objectives defined above it is likely that the following remedial strategy could be utilised. It is recommended that a pragmatic approach be undertaken, with observational techniques being employed at each stage of the work.

It is anticipated that as part of the development a site strip will be implemented, wherever the contaminated made ground is recorded this shall be either wholly removed or fully encapsulated beneath the permanent structure. This shall fully sever any pathways to end receptors. Where made ground is encountered for removal offsite this is likely to require classification for disposable by means of Waste Acceptance Criteria (WAC) testing.

Ground-works

During the ground-works phase of the development, protection to the site operatives is required. The risk to site operatives is considered under the Health and Safety at Work Act 1974, together with regulations made under the act, which includes the Control of Substances Hazardous to Health (COSHH) regulations. Therefore, the risks to site personnel must be considered under the Construction Design and Management (CDM) regulations at the planning stage and be

included in the contractor's Health and Safety Plan and site-specific Method Statements. These documents should include the following main elements.

- Site operatives at all levels should be made aware of the hazards of working with contaminated soils and the potential hazards associated with materials containing lead.
- Personal hygiene facilities, including washing and messing, must be provided and site operatives be encouraged to use them.
- Where work is undertaken in dry weather the site should be dampened down to avoid dust. In addition, dust masks must be provided to all site operatives for use in dry weather.
- In order for contaminated soils to be disposed of to an appropriate landfill, it may be necessary to carry out Waste Acceptance Criteria (WAC) testing in accordance with BS EN 12457.
- Any stockpiles of contaminated soil on site should be sheeted over to prevent excessive amounts of airborne dust and cross contamination of imported fill.
- Where vehicles are transferring soil to the landfill site they should be covered to prevent contamination of the surrounding area by dust.
- Where work is undertaken in wet weather, vehicle and wheel washing facilities are required to ensure that the vehicles leaving the site do not transfer contamination to surrounding areas.

On completion of the ground-works a careful site inspection of the sub-grade would be required. Should visual or olfactory evidence of contamination be revealed then further testing may become necessary.

Construction

During the construction phase of the contract the following items are required to protect the end user from the potential contaminants revealed at this site.

- Beneath buildings, pavements and hard-standings clean inert granular sub-base should be employed.
- Any redundant services revealed at this site should be de-commissioned and piped services sealed. Any existing services that are to be employed in the new development should be carefully inspected to ensure that they are serviceable.
- It is recommended that suitable gas protection measures be employed in the construction of the building to protect against the latent risks arising from the underlying infilled quarry. The ground floors should incorporate a ground gas membrane and a ventilation system.
- New plastic services should be constructed in a surround of clean inert material and selected in accordance with the recommendation given in the United Kingdom Water Industry Research (UKWIR) website under Report Ref. No. 10/WM/03/21 - 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites'. The statutory water authority for the area in which site is located may have a risk assessment form to complete which allows these recommendations to be met. However, further determinand specification contamination testing may be necessary.
- For buried concrete the results of the sulphate and pH testing indicate that the design sulphate class for the site should be DS-1.

8.4 Fill Materials

It should also be appreciated that any fill material, either site-won or imported, to be employed at the site should be subjected to the following assessment to determine its suitability.

Fill materials should be initially screened, by a suitably qualified engineer to establish that:

- It is a suitable growing media if it is to be employed as such, including compliance with BS3883 (2007)
- It is free from obvious contamination i.e. visual or olfactory evidence
- It has not come from areas where Japanese Knotweed or other invasive or injurious plants are suspected to be growing
- It is not a statutory nuisance, such as being odorous
- It is free from unsuitable material i.e. whole bricks, brick ties, timber or glass.

It should also be appreciated that any fill should be subjected to validation testing to assess its suitability. The following table has been taken from YALPAG[11] documentation and may be used as a guide. Depending on the origin and nature of the material, not all fill will require the sampling frequency and testing indicated, although this should be in agreement with any regulatory bodies (such as the Local Authority).

Table 6: Validation sampling and testing

Fill Type	Frequency	Minimum Determinands
Virgin Quarried Material	1 or 2 depending on the type of stone (to confirm the inert nature of the material)	Standard metals/metalloids (As, Cd, Cr, Cr(VI), Cu, Hg, Ni, Pb, Se, Zn)
Crushed Hardcore, Stone, Brick	Minimum 1 per 1000m³	Standard metals/metalloids as above plus PAH (16 USEPA) and Asbestos
Greenfield/ Manufactured Soils	The greater of a minimum of 3 or 1 per 250m³	Standard metals/metalloids as above plus PAH (16 USEPA) and Asbestos
Brownfield/ Screened Soils	The greater of a minimum of 6 or 1 per 100m³	Standard metals/metalloids as above plus PAH (16 USEPA), TPH (CWG banded) and Asbestos Any additional analysis dependant on the history of the donor site.

The screening values for the above regime should also be agreed with any regulatory bodies; however, the following is recommended in the first instance.

Table 7: Fill screening values

Contaminant	Screening Value (Residential without Plant Uptake) (mg/kg)				Reference
	1% SOM		6% SOM		
As	39.9		39.9		Atrisk^{SOIL} SSVs
Cd	149		149		Atrisk^{SOIL} SSVs
Cr(VI)	3.62	20.5	3.63	20.5	Atrisk^{SOIL} SSVs
Cu	9060		9060		Atrisk^{SOIL} SSVs
Hg	10		20.30		Atrisk^{SOIL} SSVs
Ni	188		188		Atrisk^{SOIL} SSVs
Pb	313		313		Atrisk^{SOIL} SSVs
V	357		357		Atrisk^{SOIL} SSVs
Zn	47000		47000		Atrisk^{SOIL} SSVs

[11] *YALPAG Technical Guidance for Developers, Landowners and Consultants – Verification Requirements for Cover Systems V3.3* Appendix 1a, October 2016.

TPH CWG	See attached summary sheet	Atrisk^{SOIL} SSVs
PAH 16 USEPA	See attached summary sheet	Atrisk^{SOIL} SSVs

Please see summary sheet within Appendix 5 for full screening values including PAHs and TPHs.

The above screening values should be considered with respect to the Soil Organic Matter (SOM) of the subject material i.e. 1% SOM would be typical for granular fill and 6% SOM for topsoil. Testing should comply with UKAS and MCERTS, where applicable, and undertaken by an accredited laboratory.

Where the material has been derived from a commercial company, certificates or other industry quality protocol compliance i.e. WRAP should be obtained. However, it will be necessary to ensure that this documentation specifically related to the material being imported, it is no more than two months old and complies with the screening and frequency requirements given above.

Suitable fill materials should be either placed immediately or sufficiently quarantined to prevent cross-contamination. If it is necessary, the quarantined material should be placed on appropriate sheeting and covered to prevent it becoming mixed with contaminated soils or dust, or penetrated by mobile contaminants.

8.5 Verification Report

It is not anticipated that a verification report shall be required. However, should any materials be imported on to site, then appropriate soil testing shall be required.

9. Recommendations for Further Work

- This report should be forwarded to the relevant authorities as soon as practicable to ensure they have sufficient time to review and discuss any issues.
- Discussions with ground work contractors in relation to the requirement for testing of materials to be disposed off-site (Waste Acceptance Criteria) and the suitability of imported materials.
- Discussions with service providers regarding suitable materials for pipe work given the nature of chemical determinands found within the soils on site.

Clearly Rogers Geotechnical Services Ltd would be happy to offer advice with respect to the above and assist where necessary.

10. References

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- Wilson S, Oliver S, Mallet H, Hutchings H, Card G, *Assessing risks posed by ground gasses to buildings,* CIRIA Report C665.

Appendix 1

Site Plan

Notes:

RGS Environmental Geotechnical Specialists

Rogers Geotechnical Services Ltd

Offices 1 & 2, Barncliffe Business Park,
Near Bank,
Shelley,
Huddersfield,
HD8 8LU

Telephone: 0843 50 66 87
www.rogersgeotech.co.uk

Client:

John Holmes

Job Number:

C2405/24/E/6623

Project Details:

15 Halifax Road, Scapegoat Hill

Scale:	Not to scale - reference only

Appendix 2

Trial Pit Logs

Trial Pit Log

Trialpit No **TP01** Sheet 1 of 1

Project Name: 15 Halifax Road	Project No. C2405/24/E/6623	Co-ords: - Level:	Date 08/05/2024
Location: Scapegoat Hill, Huddersfield, West Yorkshire, HD7 4NS		Dimensions (m): Depth 1.50	Scale 1:25
Client: John Holmes			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			MADE GROUND (Dark brown, slightly sandy, slightly gravelly SILT. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of brick, concrete and sandstone. Common rootlets present).
				1.50			MADE GROUND Yellowish brown, silty, sandy, sub-angular, tabular and fine to coarse GRAVEL of sandstone with moderate cobble content. Sand is fine to coarse. Cobbles are sub-angular and tabular of sandstone). [QUARRY FILL]
							End of pit at 1.50 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP02** Sheet 1 of 1

Project Name: 15 Halifax Road	Project No. C2405/24/E/6623	Co-ords: - Level:	Date 08/05/2024
Location: Scapegoat Hill, Huddersfield, West Yorkshire, HD7 4NS		Dimensions (m): Depth 1.50	Scale 1:25
Client: John Holmes			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			MADE GROUND (Dark brown, slightly sandy, slightly gravelly SILT. Sand is fine to coarse. Gravel is angular to sub-angular and fine to coarse of brick, concrete and sandstone. Common rootlets present).
							MADE GROUND Yellowish brown, silty, sandy, sub-angular, tabular and fine to coarse GRAVEL of sandstone with moderate cobble content. Sand is fine to coarse. Cobbles are sub-angular and tabular of sandstone). [QUARRY FILL]
				1.50			End of pit at 1.50 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP03**

Sheet 1 of 1

Project Name: 15 Halifax Road	Project No. C2405/24/E/6623	Co-ords: - Level:	Date 08/05/2024
Location: Scapegoat Hill, Huddersfield, West Yorkshire, HD7 4NS		Dimensions (m): Depth 0.70	Scale 1:25
Client: John Holmes			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							TOPSOIL (Dark brown, slightly sandy, slightly gravelly SILT. Sand is fine to coarse. Gravel is sub-angular and fine to coarse of sandstone. Common rootlets present).
				0.50			Yellowish brown SANDSTONE recovered as a sandy gravel. [ROUGH ROCK]
				0.70			End of pit at 0.70 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP04**

Sheet 1 of 1

Project Name: 15 Halifax Road	Project No. C2405/24/E/6623	Co-ords: - Level:	Date 08/05/2024
Location: Scapegoat Hill, Huddersfield, West Yorkshire, HD7 4NS		Dimensions (m): Depth 0.60	Scale 1:25
Client: John Holmes			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							TOPSOIL (Dark brown, slightly sandy, slightly gravelly SILT. Sand is fine to coarse. Gravel is sub-angular and fine to coarse of sandstone. Common rootlets present).
				0.35			Yellowish brown SANDSTONE recovered as a sandy gravel. [ROUGH ROCK]
				0.60			End of pit at 0.60 m

Remarks:

Stability: Stable

Appendix 3

Laboratory Testing

Rogers Geotechnical Services Ltd
Offices 1&2 Barncliffe Business Pk
Near Bank, Shelley
Huddersfield
West Yorkshire
HD8 8LU

t: 01484 604354

e: harry.letch@rogersgeotech.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-018610

Project / Site name:	15 Halifax Road	**Samples received on:**	09/05/2024
Your job number:	C2405	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	15/05/2024
Report Issue Number:	1	**Report issued on:**	15/05/2024
Samples Analysed:	3 soil samples		

Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-018610
Project / Site name: 15 Halifax Road

Lab Sample Number				193774	193775	193776
Sample Reference				TP01	TP02	TP04
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.20	0.00-0.35
Date Sampled				08/05/2024	08/05/2024	08/05/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	17	15
Total mass of sample received	kg	0.1	NONE	0.9	1.4	1.2
Asbestos						
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN
General Inorganics						
pH (L099)	pH Units	N/A	MCERTS	7.3	7.5	6.5
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	32	20	13
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	15.8	10.1	6.34
Organic Matter (automated)	%	0.1	MCERTS	6.3	4.8	7.5
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.1	0.54	0.19
Anthracene	mg/kg	0.05	MCERTS	0.3	0.16	0.18
Fluoranthene	mg/kg	0.05	MCERTS	2.9	1.5	0.4
Pyrene	mg/kg	0.05	MCERTS	2.8	1.4	0.32
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.5	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.7	0.86	0.28
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.5	1.1	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.76	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.6	0.24
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.33
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	17.9	6.18	2.05
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	17	21
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	18	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110	63	30
Lead (aqua regia extractable)	mg/kg	1	MCERTS	570	340	59
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	14	9.2
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	27	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	450	280	46

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-018610
Project / Site name: 15 Halifax Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
193774	TP01	None Supplied	0.00-0.30	Brown loam with gravel and vegetation
193775	TP02	None Supplied	0.00-0.20	Brown loam with gravel and vegetation
193776	TP04	None Supplied	0.00-0.35	Brown loam with gravel and vegetation

Analytical Report Number : 24-018610
Project / Site name: 15 Halifax Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Appendix 4

Soil Screening Value Comparison Sheet

Rogers Geotechnical Services: Soil Screening Values Comparison Sheet

Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet

Job Number	C2405/24/E/6623
Job Name	15 Halifax Road
Date	20.05.2024
Client	John Holmes

A = WS Atkins PLC, Atrisk Soil Screening Values.
A+ = Values updated June 2017.
A* = Atrisk's SSV is lower than i2's detectable limit for this compound.
B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report.
C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter.
D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used.

KEY
- Exceeds SSV
- Exceeds 2017, Below 2015
- Below limit of detection (LOD)

Determinand	Units	Ref	LOD	Residential Without Plant Uptake 6%		Sample Location	TP01	TP02	TP04							
				Atrisk 2015 (No Free Product	Atrisk 2017	Depth Top	0	0	0							
						Depth Base	0.3	0.2	0.35							
Cadmium	mg/kg	C	0.2		149		< 0.2	< 0.2	< 0.2							
Chromium (Hexavalent)	mg/kg	B/C	1.8	20.5	3.62		< 1.8	< 1.8	< 1.8							
Copper	mg/kg	A+	1.0		9060		110.00	63.00	30.00							
Mercury	mg/kg	A/D	0.3		20.3		0.30	< 0.3	< 0.3							
Nickel	mg/kg	A+	1.0		188		23.00	14.00	9.20							
Lead	mg/kg	C	1.0		313		570.00	340.00	59.00							
Zinc	mg/kg	A+	1.0		47000		450.00	280.00	46.00							
Vanadium	mg/kg	A+	1.0		357		38.00	27.00	26.00							
Arsenic	mg/kg	C	1.0		39.9		26.00	17.00	21.00							
Selenium	mg/kg	A	1.0		595		< 1.0	< 1.0	< 1.0							
Cyanide (Free)	mg/kg	A	1.0		34		< 1.0	< 1.0	< 1.0							
Total Phenols	mg/kg	A	1.0		519											
Naphthalene	mg/kg	A+	0.05	0	13.1		< 0.05	< 0.05	< 0.05							
Acenaphthylene	mg/kg		0.05				0.16	< 0.05	< 0.05							
Acenaphthene	mg/kg	A+	0.05	6730	937		< 0.05	< 0.05	< 0.05							
Fluorene	mg/kg	A+	0.05	0	4860		< 0.05	< 0.05	< 0.05							
Phenanthrene	mg/kg		0.05				1.10	0.54	0.19							
Anthracene	mg/kg	A+	0.05	0	37700		0.30	0.16	0.18							
Fluoranthene	mg/kg	A+	0.05		5050		2.90	1.50	0.40							
Pyrene	mg/kg	A+	0.05		3780		2.80	1.40	0.32							
Benzo[a]anthracene	mg/kg	A	0.05	9.04	9.04		1.50	< 0.05	< 0.05							
Chrysene	mg/kg	A	0.05	1010	2.64		1.70	0.86	0.28							
Benzo[b]fluoranthene	mg/kg	A	0.05	10.3	7.29		2.50	1.10	< 0.05							
Benzo[k]fluoranthene	mg/kg	A	0.05	104	4.12		0.76	< 0.05	< 0.05							
Benzo[a]pyrene	mg/kg	B/C	0.05	5.34	2.21		2.00	< 0.05	< 0.05							
Indeno(1,2,3-c,d)Pyrene	mg/kg	A*	0.05	10.3	0.368		1.10	0.60	0.24							
Dibenz(a,h)Anthracene	mg/kg	A	0.05	1.03	0.0236		< 0.05	< 0.05	0.11							
Benzo[g,h,i]perylene	mg/kg	A	0.05	104	0.112		1.10	< 0.05	0.33							
Total Of 16 PAH's	mg/kg		0.8													
Aliphatic TPH >C5-C6	mg/kg	A+	0.02	0	371											
Aliphatic TPH >C6-C8	mg/kg	A+	0.02	1240	768											
Aliphatic TPH >C8-C10	mg/kg	A+	0.05	0	205											
Aliphatic TPH >C10-C12	mg/kg	A+	1.0	1190	297											
Aliphatic TPH >C12-C16	mg/kg	A+	2.0	2710	925											
Aliphatic TPH >C16-C21	mg/kg	A+	8.0		212000											
Aliphatic TPH >C21-C35	mg/kg	A+	8.0		212000											
Aliphatic TPH >C35-C44	mg/kg		10.0													
Total Aliphatic Hydrocarbons	mg/kg		10.0													
Aromatic TPH >C5-C7	mg/kg	A+	0.01		3.32											
Aromatic TPH >C7-C8	mg/kg	A+	0.01	0	3860											
Aromatic TPH >C8-C10	mg/kg	A+	0.05	0	332											

Rogers Geotechnical Services: Soil Screening Values Comparison Sheet

Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet

Job Number	C2405/24/E/6623
Job Name	15 Halifax Road
Date	20.05.2024
Client	John Holmes

A = WS Atkins PLC, Atrisk Soil Screening Values.
A+ = Values updated June 2017.
A* = Atrisk's SSV is lower than i2's detectable limit for this compound.
B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report.
C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter.
D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used.

KEY
- Exceeds SSV
- Exceeds 2017, Below 2015
- Below limit of detection (LOD)

Determinand	Units	Ref	LOD	Residential Without Plant Uptake 6%		Sample Location	TP01	TP02	TP04								
						Depth Top	0	0	0								
						Depth Base	0.3	0.2	0.35								
Aromatic TPH >C10-C12	mg/kg	A+	1.0		1550												
Aromatic TPH >C12-C16	mg/kg	A+	2.0	2710	925												
Aromatic TPH >C16-C21	mg/kg	A+	10.0		1930												
Aromatic TPH >C21-C35	mg/kg	A+	10.0		1930												
Aromatic TPH >C35-C44	mg/kg		10.0														
Total Aromatic Hydrocarbons	mg/kg		10.0														
Total Petroleum Hydrocarbons	mg/kg		10.0														
pH			N/A				7.30	**7.50**	**6.50**								
Sulphate (2:1 Water Soluble) as SO4	g/l		0.00125				**0.02**	0.01	**0.01**								
ACM Type			N/A														
Asbestos Identification	%						Not detected	Not detected	Not detected								
ACM Detection Stage			N/A														
Moisture	%		0.01				19.00	17.00	15.00								
Soil Colour			N/A														
Other Material			N/A														
Soil Texture			N/A														
Sulphate (Total)	%		0.005														
Organic Matter	%		0.1				6.30	**4.80**	**7.50**								

Appendix 5

Fill Screening Values

Rogers Geotechnical Services Ltd.

Atkins ATRISK Soil Screening Values (SSVs) - Residential Without Plant Uptake Landuse

Tox Data Report No.	Compound	Residential without Homegrown Produce Landuse (mg/kg)				Reference
	Metals	**SOM: 1%**		**SOM: 6%**		
3	Cadmium	149		149		C
4	Chromium VI	3.62	20.5	3.62	20.5	B/C
	Copper	9060		9060		A+
7	Mercury	10.00		20.30		A/D
8	Nickel	188		188		A+
	Lead	313		313		C
	Zinc	47000		47000		A+
	Vanadium	357		357		A+
	Semi and Non Metals					
1	Arsenic	39.9		39.9		C
10	Selenium	595		595		A
	Free Cyanide	34		34		A
9	Phenols (total)	570		2330		A
	Poly Aromatic Hydrocarbons	Free product	No free product	Free product	No free product	
20	Napthalene	0.851		13.1		A+
	Acenaphthene	156	2680	937	6730	A+
	Fluorene	124	3260	4860		A+
	Anthracene	3.48	34300	37700		A+
	Fluoranthene	4880		5050		A+
	Pyrene	3650		3780		A+
	Benzo(a)anthracene	1.71	5.42	9.04		A
2	Chrysene	0.44	852	2.64	1010	A
2	Benzo(b)fluoranthene	1.22	9.68	7.29	10.3	A
2	Benzo(k)fluoranthene	0.686	99.7	4.12	104	A
2	Benzo(a)pyrene	2.17	5.33	2.21	5.34	B/C
2	Dibenzo(a,h)anthracene	0.00393	0.949	0.0236	1.03	A*
2	Indeno(1,2,3-cd)pyrene	0.0614	9.53	0.368	10.3	A
2	Benzo(g,h,i)perylene	0.0187	102	0.112	104	A
	Petroleum Hydrocarbons					
	Aliphatic C5-C6	42.9		371		A+
	Aliphatic C6-C8	99.6		768	1240	A+
	Aliphatic C8-C10	13.9		205		A+
	Aliphatic C10-C12	49.9	81.8	297	1190	A+
	Aliphatic C12-C16	20.9	385	925	2710	A+
	Aliphatic C16-C21	212000		212000		A+
	Aliphatic C21-C35	212000		212000		A+
	Aromatic C5-C7 (Benzene)	0.31		3.32		A+
	Aromatic C7-C8 (Toluene)	312		3860		A+
	Aromatic C8-C10	22.7		332		A+
	Aromatic C10-C12	139		1550		A+
	Aromatic C12-C16	155	703	925	2710	A+
	Aromatic C16-C21	1930		1930		A+
	Aromatic C21-C35	1930		1930		A+
Others						
Asbestos Not Detected						
A+ = Values update June 2017.						
A* Atrisk's SSV is lower than Chemtest's detectable limit for this compound.						
B = Health Criterion Values (available from toxicological reviews published in the C4SL project methodology report).						
C = Catergory 4 Screening Levels (C4SLs).						
D = SSV provided is for Methyl Mercury.						