Desktop Study Report

YEX4702 –1 Westland Drive, Waterlooville PO7 5UG

November 22

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Executive Summary

The below table shows a snapshot of the recommendations concerning contamination. It is advised that the report is read in its entirety to gain a better understanding of our findings.

	No Investigation	Investigation Required
Soil		✓
Groundwater		✓
Ground Gas	✓	

Investigation Recommended

We have identified potential sources of contamination that may represent a risk of harm to receptors. Investigation of the site is required to enable an assessment of this risk to be made. Works should not take place until this investigation has been completed.

Introduction

*Your*Environment was instructed by Gary Hart to produce a Phase 1: Desktop Study and Preliminary Risk Assessment Report for a site at Land adjacent to 1, Westland Drive, Waterlooville, Portsmouth PO7 5UG.

Grid reference	468555, 107865
Size of study site	0.2 hectare
Topography	53m AOD
Description of the study site and surrounding area	The study site is an area of undeveloped land under grass and mature trees, adjacent to 1, Westland Drive. The site is bordered by residential properties to the west and south. Residential properties also bound the site to the north. Mature trees and a college bound the site to the east.

It is understood plans for the redevelopment of the site comprises:

Construction of a detached low rise dwelling with associated parking, access and soft landscaping

The purpose of this report Is to support the discharge of a planning condition (Condition 12) attached to the planning application submitted to Havant Borough Council (ref: APP/20/00551).

The current and proposed development plans can be viewed in Appendix A.

The objectives of this report are to:

Establish the environmental setting, including sensitivity in relation to human health, surface water, groundwater and ecological receptors
Review historical and recent uses to assess the potential for contamination to be present from past and current land-use
Assess by qualitative means the potential nature and extent of contamination from those uses and the environmental risk and liabilities which may affect the site redevelopment
Identify the prevalent source-pathway-receptor linkages present on site by means of a Tier 1 Contamination Risk Assessment which incorporates the formulation of a Conceptual Site Model (CSM)

During the production of this report the following information sources have been utilised:

Data obtained from Groundsure
Historical Ordnance Survey (OS) mapping
Site walkover

Zetica bomb risk maps

Recent and most significant available planning history on the Havant Borough Council Planning Portal.

The full information from these sources can be reviewed within Appendices B & C.

The information contained in this report is intended for the use of the named client (or their approved contractors). Should any part of this report be relied on by a third party, that party does so wholly at its own risk and YE disclaims any liability to such parties. Should the purposes for which the report issued, or the proposed use of the site change, this report may no longer be valid and further use of, or reliance upon the report in those circumstances shall be at the client's sole and own risk. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. YE should in all such altered circumstances be commissioned to review and update this report accordingly.

Planning History and Previous Reports

A review of the available documents on the Havant Borough Council Planning Portal suggests that there is a limited history of planning applications associated with the postcode ‘PO7 5UG’.

The only planning record associated with the study site is that which pertains to this report.

A single application dated 2022 was identified within the same postcode area (ref: APP/22/00404) for the demolition of an existing conservatory and erection of a single storey extension. Permission was granted in June 2022 subject to three (3no) conditions, none of which related to contaminated land.

All other records were deemed irrelevant in the context of this report based on the unknown status of the applications, the nature of the developments being for minor property adjustments and the age of the other applications.

Environmental and Geological Setting

Information on the environmental and geological setting of the site is presented in Appendix B.

Site Geology

Site geology has been assessed using information from British Geological Survey (BGS) mapping and is summarised below:

Artificial/ Made Ground	There are no records of artificial or Made Ground underlying the site.
Superficial Ground and Drift Deposits	The are no superficial ground deposits recorded underlying the study site.
Bedrock Geology	Directly underlying the site are bedrock deposits comprised of the Wittering Formation (sand, silt and clay).
Landslips	There are no records within 250m.
Linear Features	One (1no.) record referring to an axial plane trace of major syncline is loca 217m to the southwest

The following hazard ratings on site are:

Shrink swell clays	Moderate
Running sands	Very low
Compressible deposits	Negligible
Collapsible deposits	Very low
Landslides	Very low
Ground dissolution	Negligible

Site Hydrogeology and Hydrology

These records are derived from Environment Agency and BGS data. Details of the source and coverage of specific records are provided in the Appendices.

Principal Aquifer	Layers with high intergranular and/or secondary permeability capable of supporting water supplies at strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Major Aquifers
Secondary (A) Aquifer	Permeable layers capable of supporting water supplies at a local rather tha strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Minor Aquifers
Secondary (B) Aquifer	Predominantly lower permeability layers which may store limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water bearing parts of former Non-Aquifers
Secondary Undifferentiated Aquifer	Layers that cannot be attributed to a category A or B rock type. These layers could have previously been described as a minor or a non-aquifer due to their variable characteristics
Unproductive strata	Rock layers or drift deposits with low permeability that h significance for water supply or river base flow

Aquifer and geological permeability are summarised below:

Aquifer within Superficial Deposits	No superficial deposits are recorded on site. Secondary undiffe aquifers are recorded 105m to the north and 314m southeast in adjacent Head superficial deposits.
Permeability of Superficial Deposits	There are no superficial deposits recorded underlying the site.
Aquifer within Bedrock Geology	As a result of the bedrock geology on site, the Wittering Formation is considered a Secondary (A) Aquifer.
Water Framework Directive Groundwater Bodies	There are no records on site.

Permeability of Bedrock Deposits	The minimum permeability is recorded as being low with t permeability recorded as being high.
Groundwater Vulnerability	The groundwater vulnerability in the vicinity of the site is classified as medium due to the Secondary (A) Aquifer in the underlying bedrock deposits.
Groundwater Abstraction Licences	There are no records of groundwater abstraction licences within 2000m.
Surface Water Abstraction Licences	There are no records of surface water abstraction licenses within 2000m.
Potable Water Abstraction Licences	There are no potable abstraction licences within 2000m.
Source Protection Zones	One record for a type 1c Source Protection Zone (confined aquifer) is recorded on site with the description: Inner catchment within confined aquifer.
OS Water Network	There are no records OS water networks within 250m.
Surface Water Features	There are no records within 250m.
Water Fram ework Directive Surface Water Bodies and Catchments	The site is within the Potwell Trib WFD surface water body catchment (ref. GB107042016400).

Environmentally Sensitive Areas

These records are derived from Environment Agency, Natural England, Historic England, English Heritage, Forestry Commission and UK Government data. Details of the source and coverage of specific records are provided in Appendices.

Environmental and Habitat Designations	Twenty-three (23no.) records of Designated Ancient & Semi-Natural Woodland are recorded within 200m of the site, the closest of which are located 282m to the northwest and 328m to the south and southeast. The site is within the Chichester, Langstone and Portsmouth Harbours Eutrophic Water Nitrate Vulnerable Zone (NVZ). It also resides within an SSSI Impact Risk Zone.
Visual and Cultural Designations	There are no records of visual/cultural designations.

Past Land Use and Potential Contaminant Sources

Information on past land use and potential contaminant sources is presented in Appendix B.

Land Use Records

These records are derived from historical mapping and each record corresponds to a particular map revision date.

Historical land use records are summarised below:

Land Use	Distance and Direction	Groundsure Record Date	Sources Summary
Unspecified Factory	On site	1963	Y
Sand pit	67m north	1866	Y
Unspecified Heap	186m northeast	1980 & 1991	Y
Dairy Farm	331m –364m southwest	1898 - 1991	N

Current land uses are summarised below:

Land Use	Distance and Direction	Sources Summary
Electricity Substations	2m northwest (groundsure earliest date: 1981) 73m northeast 124m north 192m south	Y
Gas Governor Station	133m south	N
Sewage Pumping Station	196m northwest	N

Land Use	Distance and Direction
Historical Tanks	There are no records within 250m.
Historical Energy Features	There are seven (7 no.) records of electricity substations within 250m The closest of which is recorded on site (0m northwest) and has a recorded date of 1981-1993.
Historical Petrol Stations	There are no records of historical petrol stations within 250m.
Historical Garages	There are no records within 250m.
Historical Military Land	There are no records of historical military land within 250m.
Current or Recent Pe Stations	There are no records within 250m.
Electricity Cables	There are no records of high voltage underground electricity cables within 250m.
Gas Pipelines	There are no records of high-pressure underground gas pipelines within 250m.
Railway Infrastructure	There are no records within 250m.

Environmental Permits, Incidents and Registers

These records are derived from local authority, Health and Safety Executive and Environment Agency data. Details of the source and coverage of specific records are provided in the Appendices.

These data are summarised below:

Sites Determined as Contaminated Land	There are no records of sites determined as contaminated land under Part 2A of the Environmental Protection Act 1990 within 250m.
Control of Major Accident Hazards (COMAH)	There are no records within 250m.
Regulated Explosive Sites	There are no records within 250m. Note that details of some sites may be redacted for security reasons.
Planning Hazardous Substances Consents	There are no records within 250m.
Historic IPC Licensed Activities	There are no records within 250m.
Part A (1) Licensed Activities	There are no records within 250m.

Part A (2)/B Licensed Activities and Pollutant Release	There are no records within 250m.
Radioactive Substance Authorisations	There are no records within 250m.
Licensed Discharges to Controlled Waters	There are no records within 250m.
Pollutant release to Surface Waters (Red List)	There are no records within 250m.
Pollutant Release to Public Sewer	There are no records within 250m.
List 1 and List 2 Dangerous Substances	There are no records within 250m.
Substantiated Pollution Incidents	There are no records within 250m.
Pollution Inventory Substances	There are no records within 250m.
Pollution Inventory Waste transfers	There are no records within 250m.
Pollution Inventory Radioactive Waste	There are no records within 250m.

Waste and Landfill

These records are derived from Environment Agency, BGS, OS and local authority data. Details of the source and coverage of specific records are provided in the Appendices.

Active or Recent Landfill	There are no records within 500m.
Historic Landfill	There are no records within 500m.
Non-Landfill Waste Records	There are no records within 250m.

Mining, Ground Workings and Natural Cavities

These records are derived by from BGS, OS, Coal Authority, Peter Brett Associates, Johnson Poole and Bloomer, Cheshire Brine Subsidence Compensation Board, British Gypsum, Mining Searches UK, Kaolin and Ball Clay Association and local authority data. Details of the source and coverage of specific records are provided in the Appendices. The data are summarised below:

Natural Cavities	There are no records within 250m.
Mining Cavities	There are no records within 250m.
BritPits Data (Surface and Underground Mineral Workings)	There are no records within 500m.
Historic Mineral Planning Areas	There are no records within 500m.
Surface Ground Workings	There are five (5 no.) records within 250m, referring to a sand pit (67m north), ponds (159m west and 196m northwest), an unspecified heap (186m northeast), and a pool 210m southeast.
Underground Workings	There are no records within 250m.
Coal Mining	There are no records held by the Coal Authority or by Johnson Poole and Bloomer within 250m.
Non-Coal Mining	There are no records for non-coal mining. There are no records within 250m for brine e› gypsum, tin or clay mining.

Radon and Background Soil Chemistry

These records are derived by from BGS and Public Health England data. Details of the source and coverage of specific records are provided in the Appendices.

Radon

The study site is not located within a Radon Affected Area, as less than 1% of properties are above the Radon Action Level. No radon protective measures are necessary for new properties or extensions to existing ones, as described in publication BR211 by the Building Research Establishment.

Background Soil Chemistry (estimated by BGS)

Arsenic	15 mg/kg
Bio-accessible arsenic	No data
Lead	100 mg/kg
Bio-accessible lead	60 mg/kg
Cadmium	1.8 mg/kg
Chromium	60-90 mg/kg
Nickel	15-30 mg/kg

Unexploded Ordnance (UXO)

The site is in an area considered to be at moderate risk from wartime unexploded ordnance. The Zetica bomb risk map is reproduced in Appendix E.

Historic Mapping

The object of this search is to report on the evidence of site history and redevelopment of the site and its environs from available County Series, OS Maps and aerial photography.

Year	On site	Off site
1866	Site is partly made up of woodla partly open field	Dairy Farm 330m southwest Well 300m south and 500m north Sand Pit (A) 70m north Crookhorn Farm 350m southeast Coppices to the north, west and northwe
1868	No discernible changes	Sand pit (B) recorded 40m east
1895	No discernible changes	Purbook Industrial School 50m east. Site now immediately surrounded by unspecified buildings, one of which is labelled as a school. Sand pits (A&B) no longer recorded on OS maps
1897	Unspecified building now present on site. Large unspecified factory to the northeast of the site intersects site bound penetrates the site.	Large factory building adjacent to and on the study site
1908-1909	No discernible changes	No relevant changes
1930-1932	No discernible changes	Further residential expansion to the north. More unspecified buildings surrounding the site, assumed residential.
1937-1939	No discernible changes.	No relevant changes.
1954-1959	No discernible changes.	School Playing field immediately to the south and west of the site
1962-1967	No discernible changes.	No relevant changes
1973	Site is now partly playing field and party flat open ground. Buildings on site and adjacent factories no longer prese mapping	Many residential developments to north and west demolished and are now no longer recorded on mapping. Electricity substation 70m northeast and 100m east
1976-1981	No discernible changes. Site has no recorded structures	New residential developments built to north and west. Electricity substation immediately northwest of the site (0m N

1991	No discernible changes	No relevant changes
2001	No discernible changes	No relevant changes
2010	No discernible changes	No relevant changes
2022	No discernible changes	Playing field to the south is now residential developments

The Historical OS Maps are available in Appendix C.

Walkover Survey

Date	24th October 2022
Weather	Dry and moderate cloud coverage
Current Use	The site is a land parcel which is currently used for storage (in a small wooden shed) and is currently undergoing the early stages of development including degrading of soils and clearance.
Access	The site is accessible via the south of Westland Drive.
Topography	The site was generally flat and level, with a localised incline of topography in the south-west corner. This is likely temporar gravels, soils and debris have been piled during clearance and flattening.
Structures	A single wooden shed building was identified at the west of the study site which did not contain any products of significance. An electrical substation in good condition was identified adjacent and to the west of the study site. This is bordered by brick walls. The ground surface in this area is laid to pebbles.
Ground Covering	The ground covering comprises of permeable exposed soils including what appears topsoil, shallow Made Ground and areas laid to grass.
Vegetated Areas	Vegetated areas are minimal and including a small patch of grass to the southeast of the study site, as well as a single tree at the east of the study site, which is to remain due to its protected status.
Drainage	No surface drains were noted during the walkover
Services	No services were noted on site, however a electrical substation was identified immediately west.

Direction	Boundary
North	2m brick wall/2m wooden fencing
East	2m wooden fencing/trees
South	2m wooden fencing
West	2m brick wall/2m wooden fencing

Direction	Surrounding Land Use
North	Residential properties
East	College
South	Residential properties
West	Electricity substation and Residential properties

Potential on site sources

Shallow Made Ground which may contain heavy metals and potentially asbestos containing materials

Potential off-site sources

- Poly-chlorinated biphenyls (PCBs) from the electrical substation immediately west

Sources, Pathways and Receptors

Potential Sources

Source	Identified by	Location	Description
Potential Made Ground on site associated with historic development	Groundsure Geo+Enviro Insight	On site	Made Ground may contain a broad spectrum of contaminants including TPH, PAH asbestos and heavy metals. Made Ground may also be a potential source of ground gas generation, if deep.
Unspecified buildings and factory on and adjacent to site	Groundsure Geo+Enviro Insight	On and adjace to site	Factories and industrial buildings can be associated with a variety of contaminants including heavy metals, hydrocarbons, VOCs/sVOCs and asbestos.
Electricity Substation	Groundsure Geo+Enviro Insight	Adjacent and west	Electricity substations are associated with harmful PCB contaminants that are typ immobile, however, the proximity of this substation suggests that it may pose a risk.
Sand Pit	Groundsure Geo+Enviro Insight	67m northwest 40m east	Backfilled voids and pits can become a potential source of harmful ground gas produ The recorded sand pits were first noted in 1866 and were no longer noted on ordnance maps in 1895.

The following contaminants are potentially associated with the on-site sources:

Heavy Metals
Potential Asbestos Containing Material (PACM's)
Polycyclic Aromatic Hydrocarbons (PAH)
Total Petroleum Hydrocarbons (TPH)
Volatile Organic Compounds (VOC)
Semi Volatile Organic Compounds (sVOC's)

The following contaminants are potentially associated with off-site sources:

Heavy Metals
Potential Asbestos Containing Material (PACM's)
Polycyclic Aromatic Hydrocarbons (PAH)
Total Petroleum Hydrocarbons (TPH)
Volatile Organic Compounds (VOC)
Semi Volatile Organic Compounds (sVOC's)

Pathways

Pathway	Medium	Properties
Direct Contact	Dust, solid and liqu phase	There may be direct contact with pc impacted soil and Made Ground across the There is a possibility of dust fumes being produced during earthworks in the construction phase. Dermal contact and ingestion of potentially contaminated soils during construction or operational phase of the site.
Leaching through Made Ground	Unsaturated flow	Potential for leaching and migration of potential contaminants along preferential flow paths in the ground.
Foundations and Underground Infrastructure and Obstructions	Preferential flow	Contaminants will flow the path of least resistance which can be gaps around foundations, services, and floor construction
Migration of Ground Gas	Gaseous flow	Infilled land material is likely to be variable in composition. Migration through granular material within superficial deposits is possible.

Receptors

Category	Receptor	Properties
Humans	End users (such as residents and visitors)	Potential contact with contaminated s existing/proposed soft landscaping areas. Potential contact with ground gas within enclosed buildings
	Construction workers	Reworking of contaminant impacted materials in underlying soil during construction works can expose workers to contamination.

Property	Materials and site structures	Foundations and site services may be dama by potentially aggressive compounds present in soils.
Controlled Waters	Underlying superfic / bedrock Aquifer and surface water	The site is recorded as having a Secondary (A aquifer in the bedrock deposits underlying the site.
Plant (species and uptake) and Wildlife	Various	Attributes will be influenced by factors su relative quality, scale, rarity and substitutability.

Preliminary Conceptual Site Model (CSM)

The assessment is undertaken based on the current proposals for the site.

Proposed Land use Assessment Criteria

Residential with consumption of homegrown produce

Any change in the development proposals for the site involving a change in end use class will result in a requirement for this assessment to be revised.

On Site						
Source	*Pathways*	*Receptor*	*Severity*	*Probability*	*Risk*	*Justification*
Subsurface soils possibly containing metals, TPH, PAH, VOC's and sVOC's	Ingestion, dermal contact, inhalation of dusts and vapours	Future end users and site visitors	Severe	Low likelihood	Moderate	Due to the historical development on site dating back t 1895, contamination of onsite soils may be possible. In addition, contact between future end users and shallow soils is likely and the consumption of homegrown produce is possible. An electricity substation dating back to 1976 is also present adjacent and west of the site. Electricity substations are a source of harmful PCBs.
		Construction Workers	Severe	Low likelihood	Moderate	Construction workers are likely to come into direct contact with soils during groundworks. Safe working practices should be implemented, and appropriate personal protective equipment (PPE) should be used to mitigate any potential risk from contact with soils and shallow/perched groundwater.
	Leaching through soils and migration via groundwater or soil pores	Controlled Water	Severe	Low likelihood	Moderate	A m oderate risk has been assessed due to the potential for contaminants on site and the Secondary (A) aquifer in the underlying bedrock geology. The underlying geology also has low to high maximum permeability and moderate groundwater vulnerability.

On Site						
Source	*Pathways*	*Receptor*	*Severity*	*Probability*	*Risk*	*Justification*
	Permeation of water pipes	Construction materials, future end users and site visitors	Severe	Low likelihood	Moderate	Hydrocarbons, especially aromatics are known to perı plastic pipes. Provision of water supply pipes and proprietary barrier pipes may be required by the water supply company. Potential hydrocarbon sheen was noted on ponded water during the walkover.
	Uptake	Plant	Medium	Likely	Moderate	Uptake may be possible in areas of proposed soft landscaping. The potential for contamination is considered m oderate.

On Site						
Source	*Pathways*	*Receptor*	*Severity*	*Probability*	*Risk*	*Justification*
Asbestos at/near ground surface in Made Ground	Inhalation of fibres in airborne dust	Future end users and site visitors	Severe	Low likelihood	Moderate	Due to the historical development on site dating back as 1895, it is possible that asbestos-containing materi have been used during construction within the site boundary. This material could have migrated into the underlying soils and contact may be possible in areas of soft landscaping within the new developments.
		Construction Workers	Severe	Low likelihood	Moderate	A moderate risk rating has been assessed due to the historic development on site. During subsequent normal groundworks, safe working practices should be implemented, and appropriate personal protective equipment (PPE) should be used to mitigate any potential risk from residual asbestos in soils.
Ground Gases: From Made Ground: H, CH_4, CO, CO_2 and H_2S	Gas migration and build up within buildings (explosion/ asphyxiation risk)	Future end users and building structures	Medium	Unlikely	Low	There is the potential for Made Ground on site which may be a source of potential ground gas generation. Deep Made Ground is, however, considered unlikely. No landfill or mining was noted in proximity to the site. Two sand pits are recorded within 100m of the site, both dating back to 1866 and both no longer recorded after 1895. Backfilled pits are a potential source of ground gas depending on the material used to backfill, although these pits are considered to have had sufficient time to remove any credible ground gas source.

Off Site						
Source	*Pathways*	*Receptor*	*Severity*	*Probability*	*Risk*	*Justification*
Land uses in the vicinity possibly containing metals, TPH, PAH, VOC's and sVOC's	Leaching through soils and migration via groundwater or soil pore m oisture	Future end users and site visitors	Medium	Likely	Moderate	Given the low to high permeability of the underlying geology and hydrogeology, there is a moderate likelihood for the leaching and migration of contaminants. This combined with the various potentially contaminative sources identified within the vicinity of the site (including electricity substations and unspecified buildings/factories) creates a moderate risk.
	Ingestion, dermal contact, inhalation of dusts/vapou rs	Future end users and site visitors	Medium	Likely	Moderate	Given the variable permeability of the underlying geology and hydrogeology, there is a moderate likelihood for the ingestion of contaminants. This combined with the various potentially contaminative sources identified within the vicinity of the site creates a moderate risk. Possible demolition of a nearby buildings and factories, as noted in the ordnance survey historical maps and planning history, may have resulted in the upheaval of contaminants in adjacent soils and building structures.

Off Site						
Source	*Pathways*	*Receptor*	*Severity*	*Probability*	*Risk*	*Justification*
Ground Gases: From Made Ground: H, CH_4, CO, CO_2 and H_2S	Gas migration and build up within buildings (explosion/ asphyxiation risk)	Future end users and building structures	Medium	Unlikely	Low	There are no credible sources of ground gas within the surrounding area.

Recom m endations

The potential contaminant linkages are outlined with the Preliminary CSM in line with LCRM 2021. The risk with respect to Human Health is identified as Moderate. The risk with respect to Controlled Waters is also considered to be Moderate.

Based on the information assessed in this report and the proposed development plans provided in Appendix A, we would recommend that a Site Investigation (SI) is undertaken. The completion of SI will be required to inform the sign off of any relevant planning conditions, following the submission of this report to the CLO to support the current planning application. The following recommendation are provided below:

Confirmation of the final masterplan, finished levels and regulatory status is required.
Consultation with the regulator/building control should be undertaken to inform design and understanding of current gas protection measures (if any) and future requirements.
The SI and subsequent risk assessment will provide an update to the PCSM and identify next steps (if any). The ground investigation scope should include the assessment of soil and groundwater risk regime at the site.
The intrusive SI may reveal on-site sources of contamination that were not established in this report. Therefore, the CSM will be updated with contamination data obtained from the SI and used to inform next steps (if any).
The requirement for and verification of any remedial action may be required prior to the commencement of any works following the SI, dependent on the decision notice for the site which is yet to have been approved for the current planning application.
During future groundworks, safe working practices should be implemented, and appropriate personal protective equipment (PPE) should be used to mitigate any potential risk from residual asbestos in soils.

Scope of Proposed Investigation

Sampling Strategy and Soil Analysis

YE suggest the SI intrusive investigation comprises at least four (4no) hand excavated trial pits to a maximum depth of 1mbgl. All trial pits should be logged, and soil samples collected. Possible analytes YE would suggest undertaking analysis for would include:

Heavy metals
Potential Asbestos Containing Materials (PACM's)
Total Petroleum Hydrocarbons –Criteria Working Group TPH (CWG)
Speciated Polycyclic Aromatic Hydrocarbons (PAH)
Soil Organic Matter (SOM) and Total Organic Carbon (TOC)
Poly-chlorinated biphenyls (PCBs)
Volatile Organic Compounds (VOCs)
Semi Volatile Organic Compounds (sVOC's)

Should significant impact of shallow groundwaters be identified, then sampling may be necessary.

Guidance

The results from the proposed SI shall be compared against standards, such as the revised LQM/CIEH S4UL criteria [1].

Consultees

This report must be sent to the relevant Local Authority (LA) to seek their comments and subsequent approval. Works may be delayed, or additional SI required should the LA not be able to provide comment, or the works are commenced prior to obtaining comment.

Groundworks Watching Brief

Further details surrounding the watching brief and additional future requirements will be provided following the completion of the SI.

[1] Nathanail et al. (2015) The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, 2015. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3495

Notes and Limitations

The following table details the applicable distances relevant to sections to focus on the information directly relevant to the site. Information from outside these radii will be referenced when relevant.

Section	*Reference Distance*
Geology	50m (underlying geology) or 250m (structural features, borehole records)
Hydrogeology	250m (aquifers, surface water) or 1,000m (abstractions)
Environmentally Sensitive Areas	500m (environmental designations) or 250m (habitat, visual and cultural designations)
Land Use Records	250m. Several records may refer to the same feature where it is present over time. Differences in distances quoted from the study site may be due to geolocation errors
Environmental Permits, Incidents and Registers	250m
Waste and Landfill	500m (landfills) or 250m (non-landfill waste operations)
Mining, Ground Working and Natural Cavities	250m
Radon and Background Soil Chemistry	50m
Historic Mapping	100m. Each map represents a snapshot of the site and its env at the date of the survey. Changes that had occurred at other times may not have been recorded on the maps and represent an unidentified hazard to the site. The i reported might not represent all pertinent information that could be obtained. The interpretation of the maps and commented on in this report is subjective

Framework for Assessment

Risks are assessed within the risk management framework established in Part IIA of the Environmental Protection Act (EPA) 1990 introduced by Section 57 of the Environment Act 1995 which provides a statutory definition of contaminated land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that:

“Significant harm is being caused or there is a significant possibility of such harm being caused; or Pollution of controlled water is being or is likely to be caused.”

Risk from contamination is assessed in accordance with the Land Contamination Risk Management Framework (LCRM) prepared by the Environment Agency on 8 October 2020. This considers possible linkages between contaminant sources and potential receptors which could be harmed or polluted.

The key aspect of the framework is the development of a Conceptual Site Model (CSM) which considers the potential contaminant linkages between potential contaminant sources, the receptors, and the pathways by which the receptors could be exposed to the contaminants.

For a risk of environmental harm to occur due to of ground contamination, ***all*** the following elements must be present:

Source	A substance that can cause pollution or harm
Pathway	A route by which the contaminant can reach the receptor
Receptor	Something which could be adversely affected by the contan

If all are present then the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

The qualitative risk assessment (QRA) and conceptual site model (CSM) has been undertaken in accordance with Annex 4 of the R&D publication 66, Guidance for the Safe Development of Housing on Land Affected by Contamination (NHBC/EA/CIEH, 2008) which updates and supersedes CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001).

Where it is considered that there is no credible linkage, this is indicated in the table. In accordance with the R&D66 guidance, if there is no pollution linkage then there is no requirement to apply tests for probability and consequence.

Flood Risk

This report does not replace a hydrogeological survey or Flood Risk Assessment and specialist studies may need to be undertaken to ascertain the risks posed from flooding.

Limitations and Uncertainties

This report has been prepared by Your Environment with all reasonable skill, care and diligence. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources, together with a site walkover of the site.

The opinions given in this report have been dictated by the finite data on which are they based and are relevant only to the purpose for which the report was commissioned.

Information reviewed should not be considered exhaustive and should be accepted in good faith as providing true and representative data with respect to site conditions. Should additional information become available which may influence the opinion expressed in this report, Your Environment reserves the right to review such information and, if warranted, to alter the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site. This report is an environmental phase 1 report and does not consider the geotechnical implications.