ONYXGEO
CONSULTING LTD.

Remediation Strategy at:

Lower Perryland Farm

Report Reference: 251042-ON-PD-XX-RP-G-741-C01

Date: 17th June 2025

Prepared for:

Lower Perrylands Limited

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Site Address	Lower Perryland Farm, Basing Hill, Dial Post, West Sussex	Client	Lower Perrylands Ltd
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APPENDICES

1 INTRODUCTION

1.1 INSTRUCTION AND APPOINTMENT

Onyx **Geo** Consulting Ltd (referred to as Onyx Geo hereafter) was commissioned by our client, Lower Perrylands Limited to provide a remediation strategy for the site at Lower Perryland Farm, Basing Hill, Dial Post, West Sussex.

The appointment was confirmed on 2nd June 2025 via email signed by Mike Jones of Lower Perrylands Limited.

The work was undertaken based on Onyx Geo's fee proposal letter dated 2nd June 2025, quote ref: ON251042, including the outlined Terms and Conditions. This serves as the contractual agreement between Onyx Geo and the client.

1.2 PROPOSED DEVELOPMENT

We understand that the proposed development includes the partial demolition and rebuilding of five agricultural units to form residential properties with private gardens and associated parking areas. A proposed development layout plan, as submitted to Horsham District Council (HDC) under planning reference DC/24/1087 has been provided in Appendix B referenced P009_P1 dated 01/07/2024. This drawing also illustrates the demolition of some parts of the existing units. There are also outline plans for a SUDs feature in land to the west of the site.

1.3 PLANNING PERMISSION

The planning application is approved and subject to several conditions, with respect to contaminated land. Condition 1 states:

Pre-Commencement Condition: No development shall commence until the following components of a scheme to deal with the risks associated with contamination, (including asbestos contamination), of the site be submitted to and approved, in writing, by the local planning authority:

a) A preliminary risk assessment which has identified:

- *all previous uses*
- *potential contaminants associated with those uses*
- *a conceptual model of the site indicating sources, pathways, and receptors*
- *Potentially unacceptable risks arising from contamination at the site.*

The following aspects (b) - (d) shall be dependent on the outcome of the above preliminary risk assessment (a) and may not necessarily be required.

b) An intrusive site investigation scheme, based on (a) to provide information for a detailed risk assessment to the degree and nature of the risk posed by any contamination to all receptors that may be affected, including those off site.

c) Full details of the remediation measures required and how they are to be undertaken based on the results of the intrusive site investigation (b) and an options appraisal."

d) A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (c) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action where required.

To satisfy condition 1a and 1 b, a preliminary risk assessment and intrusive site investigation have been completed for the site. This document serves to fulfil the requirements of condition 1c and 1d.

1.4 AIMS AND OBJECTIVES

The aim is to satisfy planning conditions 1c and 1d of planning application reference DC/24/1087 by Horsham District Council. The objectives to achieve this are to:

- Summarise the findings of the previous investigations to define the relevant contaminated land linkages that require remediation.
- Provide a sustainable remediation strategy to:
    - Manage the source through removal, destruction, modification or immobilisation; or
    - Interrupt or block the pathway; or by
    - Modifying the receptor.
- Define the information required to demonstrate that the remediation at the site is complete.

1.5 REGULATORY FRAMEWORK AND GUIDANCE

This report has been undertaken in line with the UK government guidance on Land Contamination Risk Management (LCRM).

1.6 PREVIOUS INVESTIGATIONS

The following relevant reports have previously been prepared by Onyx Geo for the site, to which the reader is referred:

- Desk study report by Onyx Geo dated 14/04/25 (report ref: ON251025-ON-PD-XX-RP-G-701-C01).
- Phase II site investigation report by Onyx Geo dated 30/05/25 (report ref: ON251030-ON-PD-XX-RP-G-713-C01).

At time of writing, we are not aware if the desk study or phase II investigation report have been submitted to HDC for discharge of conditions 1a and 1b.

1.7 APPOINTMENT LIMITATIONS

This report is addressed to and may be relied upon by Lower Perrylands Farm Limited. This assessment has been prepared for the sole use and reliance of the above-named party. This report has been prepared in line with the Onyx Geo proposal and associated notes. It shall not be relied upon or transferred to any other parties without the express written authorisation of Onyx Geo. The report should be read and used in full. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

Third party information used in the production of this report has been taken in good faith as being accurate. Onyx Geo cannot and will not accept any liability for errors and/or omissions in data provided by others and Onyx Geo cannot warrant the work of others.

2 SITE SUMMARY

2.1 SITE BACKGROUND AND ENVIRONMENTAL SETTING

A summary of pertinent features about the site and applicable to this report is summarised below. A more detailed site description is included within the phase 1 desk study report (ref: ON251025-ON-PD-XX-RP-G-701-C01 dated 14/04/25).

2.1.1 Site location, description and current use

The site comprises an irregularly shaped 0.95 ha plot of land situated approximately 1 km to the southwest of the village of Dial Post and approximately 0.6 km to the west of the A24 centred on grid reference 514471, 118810. A site location plan and a site layout plan are included as Figure 1 and Figure 2 within Appendix B.

In the centre of the site are five former cattle barns in varying states of disrepair, labelled as units 1 to 5 on Figure 2. Units 1 and 2 are suspected to be roofed with asbestos cement tiles. Internally, the barns are surfaced with a mix of bare earth, gravel (shingle and crushed brick / concrete rubble) and concrete. A concrete road provides access to all the barns and concrete surfacing is present between units 4 and 5. Some relict agricultural equipment is stored on this concrete surfacing. A small breeze block structure is present to the north of unit 5, with a grain silo and a larger barn further to the north of unit 4. Two brick-built barns are present to the southwest of unit 1. The remainder of the site predominantly consists of fields or areas of dense vegetation. Waste aggregate (concrete and brick rubble) is seen in places in the vegetation and a small green house in dense vegetation is present in the far southeast.

A stream (a tributary of the Lancing Brook) is present, aligned east to west through the northern part of the site, culverted under the hardstanding access road and along the eastern side of the site. The stream is approximately 1- 1.5m below current ground level and the banks are overgrown with vegetation.

At the time of the desk study report unit 1 was being used to store a boat and a mobile home and a stack of suspected asbestos cement sheets were observed within the barn west of unit 1. There were several spoil heaps of waste located around the site and concrete and breeze blocks were identified within the vegetation. There were also tyres stockpiled in front of the central barn building. These features are highlighted on the constraints plan, as Figure 3 in Appendix B.

2.1.2 Geology and hydrogeology

The British Geological Society (BGS)[1] mapping records the site as being underlain by the bedrock of the Weald Clay Formation. No superficial deposits were mapped by the BGS for the site, although Head deposits were shown approximately 40 m to the east of the site. Superficial deposits typically 0.90 m to 1.40 m deep were encountered onsite during the site investigation and described as sandy silty clay with clayey gravelly sand encountered in one location (TP06).

The offsite superficial deposits are classified as a secondary aquifer undifferentiated and the bedrock as unproductive strata.

[1] https://mapapps2.bgs.ac.uk/geoindex/home.htm

The site does not lie within a radon risk area.

2.1.3 Hydrology

The nearest surface water course is a tributary of the Lancing Brook located in the north of the site, as described above. The last catchment data record for the Lancing Brook dated 2022, described it as poor for ecology and moderate for physico-chemical properties. In 2019 it failed its chemical classification.

2.1.4 Site history

The site was occupied by barns from 1875 to current date, with various periods of construction taking place in the 1940s, 1970s and 2000s. Some buildings in the west of the site appear to have been demolished in the 1990s. Recent aerial imagery indicated that the site was occupied by vehicles, caravans and farm machinery and stockpiling of unknown material was evident in the western half of the site.

The historical land use in the wider site area (within 250 m of the site) was predominantly shown as agricultural fields, woodlands, farm buildings and residential land use.

2.1.5 Previous investigations

Desk study report by Onyx Geo ref: ON251025 dated April 2025

The desk study identified the following potential contaminant linkages:

Human health

Future land users and construction workers via direct soil / dust ingestion; indoor / outdoor dust inhalation; indoor / outdoor vapour pathways; and consumption of homegrown produce and soil attached to homegrown produce (future land users only) from:

- Asbestos in soil (high risk);
- Made ground from historical land uses potentially containing heavy metals and hydrocarbons, including polycylic aromatic hydrocarbons (PAHs) (low to moderate risk);
- Pesticides from agricultural land use (low risk).

Controlled waters

The geology beneath the site was mapped as unproductive strata, as such a critical groundwater receptor was not present at the site and was not considered further in the assessment.

A potential contaminant pathway was identified for the stream in the north of the site, where unforeseen contamination may be mobilised from construction and groundworks activities, and transported to the watercourse via surface water runoff.

Ground gases

The desk study did not identify a significant ground gas source on or offsite or a gas migration pathway that would pose a risk to the proposed development. The risk from ground gases was not considered further.

Phase II site investigation report by Onyx Geo ref: ON251030 dated 30/05/25

An intrusive ground investigation was undertaken on 6th May 2025 and comprised the excavation of eight machine excavated trial pits (TP01-TP08) to depths between 2.70 m and 3.00 m bgl and the collection of shallow surface samples in two locations.

Shallow made ground (0.20 m to 0.50 m bgl) was encountered in four locations TP01,TP02, TP07 and TP08.). TP01 and TP02 were located within the farmyard to the north of the barns, TP08 was within the area of demolished structures, as shown on historical maps and TP07 was approximately where historical stockpiling may have occurred.

Selected made ground and natural soil samples were scheduled for potential contaminants of concern, including heavy metals, PAHs, asbestos and pesticides. Asbestos was detected in shallow made ground soil samples from TP01 and TP02, PAHs were detected above generic assessment values in a shallow made ground sample from TP02 and asbestos was reported from a surface fragment of cement bonded asbestos taken from close to unit 1.

Two topsoil samples, one from TP03 and one from TP05 were tested for pesticides, which were reported at concentrations below the limit of quantification.

The phase II report included updated background information that indicated the potential for a cess pit and fuel storage on site. Although neither were observed during the desk study walkover or phase II investigation.

2.1.6 Data review

Although only limited investigation has been undertaken within the footprint of the barns, no direct pathway will exist between the soil and future land users once the ground floor slab has been installed. To date the desk study and ground investigation did not identify evidence of volatile organic compounds that would pose a risk to the end use, noting the potential for past fuel storage on site.

Two trial pit locations were excavated in the land to the west of the site where historical stockpiling of material may have occurred and where historical buildings were demolished. No significant contamination was observed in these areas during the investigation and subsequent testing.

No areas of deep made ground were encountered in the areas investigated confirming that there is a low likelihood of encountering gas generating sources that would pose a risk to the site.

Slightly damp soils were recovered from TP03 at 2.3 m bgl and a slight groundwater seepage was noted in TP05 at 2.8 m bgl. This confirms that groundwater is not a critical receptor at this site

A number of stockpiles were observed around the site that will require characterisation prior to offsite disposal. Sporadic suspected cement bonded fragments were observed at surface around the barns.

3 CONCEPTUAL SITE MODEL

3.1 CONCEPTUAL SITE MODEL

This chapter identifies the contaminant linkages identified to date that require further assessment or remediation.

3.1.1 Approach

As outlined within LCRM, a risk-based approach is applied to assess contaminated or potentially contaminated land. For a risk to exist, a contaminant linkage must be present, meaning a source of contamination, a potential receptor, and a pathway connecting the two must be present for that risk to be realised. The purpose of the conceptual site model (CSM) is to identify the relevant contaminant linkages using the information within section two of this report. A site is considered suitable for use if no complete contaminant linkages can be envisaged following the conclusion of the development.

3.1.2 Source of onsite contamination

The following potential sources of onsite contamination have been identified:

- Fragments of asbestos cement and loose fibres (albeit at trace levels) in made ground soils.
- Localised elevated PAHs within the made ground soils in land to the north of the central barns (units 1, 3-5).
- Stockpiles of material of unknown composition.
- Stockpile of cement bonded asbestos roof tiles stored in the barn west of unit 1 and sporadic fragments of cement bonded asbestos at surface near to the barns.

There is also the potential for previously unidentified contamination including within the existing structures; in the land to the west of the existing barns, where historical stockpiling of unknown materials and demolition of historical buildings occurred; and there are records of fuel storage on site and a below ground cess pit.

Several of the barns are walled and roofed with asbestos cement tiles. These structures will be demolished as part of the redevelopment.

3.1.3 Potential receptors

The following potential receptors were identified:

- Human health:
  - Future end users of the site including residents and maintenance workers.
  - Construction phase ground workers.
- Controlled waters
  - Onsite surface water feature (inland river: tributary of Lancing Brook).
- Potable water supply pipes.

3.1.4 Relevant contaminant linkages

A risk is only considered to be present where a contaminant linkage between a source and receptor is present within the proposed development. No relevant contaminant linkage has been identified from offsite sources, and for groundwater receptors, as described in section 2.

A summary of relevant contaminant linkages (RCL) that require remediation are listed in Table 2, below.

Table 2 Summary of relevant contaminant linkages (RCL)

RCL	Source	Pathway	Receptor
RCL1	Cement bonded asbestos fragments at surface. Asbestos cement sheets stockpiled in one of the barns	Inhalation of asbestos fibres, if damaged or weathered with age.	Site residents. Site maintenance workers. Construction workers.
RCL2	Locally, PAH concentrations elevated above GAC within shallow made ground. Visible asbestos bonded cement fragments in shallow made ground. Loose asbestos fibres (trace concentrations) in shallow made ground.	Dermal contact with contaminated soil or dust, ingestion of homegrown produce and attached soil, inhalation of dust and soil vapours (vapour risk is considered minor for the PAH detected). Inhalation of asbestos fibres. Mobilisation and migration via surface water runoff.	Site residents. Site maintenance workers. Construction workers. Tributary of Lancing Brook.
RCL3	Stockpiles of waste material of unknown composition.	Dermal contact with contaminated soil or dust, inhalation of dusts. Inhalation of asbestos fibres.	Site residents. Site maintenance workers. Construction workers.
RCL4	Previously unidentified contamination at the site, including: fuel storage; and cess pit.	Dermal contact with contaminated soil or dust, ingestion of homegrown produce and attached soil, inhalation of dust and vapours. Mobilisation and migration via surface water runoff.	Site residents. Site maintenance workers. Construction workers. Tributary of Lancing Brook.

4 REMEDIATION OBJECTIVES AND OPTIONS APPRAISAL

4.1 REMEDIATION OBJECTIVES

The specific objectives to this project are to design a strategy whereby remediation breaks the relevant contaminant linkages and thus the contamination present does not pose an unacceptable risk to the identified receptors including future land users and the stream.

4.2 SITE SPECIFIC CONSTRAINTS / LIMITATIONS AND OPTIONS APPRAISAL

There are several factors likely to affect the choice of remediation techniques available for the site. These include:

- The types of contaminants present in made ground soils i.e. localised PAH, asbestos fragments and trace concentrations of loose asbestos fibres may limit certain types of remediation techniques.
- The site investigation to date indicates shallow made ground and surface soils are affected. This could make some remediation techniques cost prohibitive over others.

In general, remedial methodologies for the site seek to either:

- Manage the source through removal, destruction, modification or immobilisation.
- Interrupt or block the pathway; or by
- Modifying the receptor.

Other techniques applicable to in ground contamination could include *insitu* soil stabilisation; or raising site levels and capping the affected areas. However, hard and soft landscaping plans have not been made available to Onyx Geo, as such it is not possible to assess whether these options are feasible at this stage.

Given the above, it is considered at this stage most appropriate method is to remove the contaminated made ground soils (source management) and replace with a clean imported soil (interrupt the pathway, if deep made ground is present).

Although excavation and removal of contaminated made ground soils from the site scores poorly on cost and sustainability criteria, in the absence of design information on finished site levels and landscape plans, it remains an effective technique to protect future land users and the surface water receptor. It would also likely meet regulatory requirements and project timescales.

For the sporadic surface asbestos fragments and asbestos sheets removal from site to a suitably licensed waste receiving facility is considered appropriate.

5 SITE SPECIFIC REMEDIATION STRATEGY

The remediation strategy provides the approach to the mitigation of the identified relevant contaminant linkages at the site.

5.1 ASBESTOS FRAGMENTS AT THE SURFACE

Sporadic fragments of cement bonded asbestos were visible at surface close to the barns, as were suspected cement bonded asbestos sheets stored in the barn west of unit 1. A number of stockpiles are located around the site and these have not been tested for asbestos, which may be present within the materials. The approximate locations of the asbestos fragments, and sheets are illustrated on Figure 3.

These materials will need to be removed by a competent and suitably trained/licensed contractor in accordance with, but not limited to Control of Asbestos Regulations 2012; Control of Asbestos Regulation 2012 Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials; and relevant asbestos and health and safety guidance. It should be documented and verified as having been removed by the appropriately trained and or licensed contractor.

It may be a cost beneficial consideration to:

- extend a wider asbestos survey, as part of the building refurbishment and demolition asbestos survey; and
- remove surface asbestos fragments, as part of the asbestos strip out from within the structures.

Once the asbestos sheets have been removed, samples of surficial soils will need to be collected and tested to confirm that loose asbestos fibres are not present beneath them that could pose a risk to future end users. This would also apply if asbestos is detected in any of the stockpiles on the site.

The details of the removal and verification should be documented and a copy kept for inclusion within the final verification report for the site.

5.2 LOCALISED PAH AND ASBESTOS IN MADE GROUND SOILS

Based on current laboratory testing a contaminant pathway linkage is considered active for PAHs and asbestos where made ground is present in proposed soft landscaped areas, including private gardens. Where the material is covered by hardstanding (roads or buildings) a pathway linkage is not considered active, although a risk remains to site workers and visitors during construction and maintenance phases.

We note that further laboratory testing may assist in reducing the volumes of made ground soil requiring excavation and disposal offsite. Should additional testing be undertaken then the risk assessment and remediation strategy will need to be updated and re-submitted to the local planning authority for approval.

Private gardens - shallow made ground (GL-0.50 m)

To date only shallow made ground has been identified at depths varying between 0.25 to 0.30 m in land to the north of the barns and 0.20 to 0.50 m in land to the west of the barns. In all garden areas (front and rear) remediation shall include the removal of the made ground soils to 100 mm into natural soils. Based on current investigations, the excavation could extend up to 0.60 m bgl in land to the west of the barns if private gardens are proposed. Following the removal of the made ground, the formation level should be inspected by a competent geo-environmental consultant prior to placement of chemically verified topsoil and subsoil.

Private gardens - deep made ground (below 0.50 m)

In the case that deeper made ground is encountered i.e. it extends below 0.50 m then the excavation should continue to 0.60 m depth and the formation level inspected. Where made ground remains at 0.60 m then soil verification samples should be collected and tested for PAH and asbestos only. Provided asbestos and / or PAHs concentrations are below made ground verification criteria then no further excavation is required. However, a geotextile membrane, such as Terram hi-viz should be placed at 0.60 m to delineate between historical made ground soils and the chemically verified topsoil / subsoils.

Where asbestos or concentrations of PAH are detected above verification criteria, then the excavation through the made ground should extend to 1.0 m or 100 mm into natural soils, whichever is the shallowest. Where made ground soils remain at 1.0 m they should be retested for PAH and asbestos. As above, provided that asbestos is not detected and / or PAHs concentrations are below assessment criteria then only the delineation layer (geotextile membrane) shall be placed at 1.0 m, prior to backfilling with the chemically verified topsoil / subsoils.

Where asbestos or PAHs are detected above verification criteria at 1.0 m then a deter to dig layer is required. The deter to dig layer from 0.85 m to 1.0 m depth will comprise a 150 mm thick layer consisting of 20 mm graded naturally quarried stone sandwiched between two geotextile membrane layers, such as Terram hi-viz.

The delineation layer or deter to dig layer is not required where natural soils are encountered at formation level.

Soft landscaped areas outside of private gardens – made ground

In soft landscaped areas outside of private gardens following surface strip it is recommended that the ground is inspected by the appointed environmental consultant to confirm areas where made ground is present. Further testing for asbestos and PAHs may also reduce the need for a cover system.

However, based on the current information, where made ground is encountered a clean cover system is required to the following depths, namely:

- in new grass covered soft landscaping the made ground shall be removed to 450 mm depth;
- where new shrubs / hedge planting made ground removed to 600 mm depths; and
- for new trees to 900 mm depth.

If natural soils are encountered at shallower depths the dig depth may be reduced and terminate at 100 mm into the natural soils. The formation level should be inspected prior to backing with chemically compliant subsoil and topsoil.

Where deeper made ground is encountered then further testing should be undertaken to confirm chemical composition. No further excavation depths are proposed, subject to the testing results. A geotextile delineation layer (e.g. Terram hi-viz) would be required if made ground soils remain in place in new soft landscaped areas.

At this stage it is assumed that imported topsoil and subsoil will be required and that site won material will not be used. The imported sub and topsoil will need to be verified as free from contamination, compliant the assessment criteria outlined in Appendix C and the chemical testing protocol outlined below.

5.3 Service utility trenches and potable water pipes

At this stage it is assumed that barrier pipes will not be required and that services will most likely run through natural soils connecting to mains supplies, this is due to the shallow nature of made ground identified to date and typical depths that potable water pipes are installed at. However, the requirements for protection of potable water supply are subject to agreement with the water utility company. It is strongly recommended that they are contacted and their requirements addressed at an early a stage.

Where utility routes extend through made ground, there is the potential to encounter fragments of asbestos cement, as such suitable controls as described above should be in place. All new service trenches extending through the site should be backfilled with clean aggregate, such as natural quarried shingle. The use of recycled construction and demolition aggregate or site won made ground as backfill in utility trenches should not be permitted.

5.4 Retained trees

Landscaping plans for the site have not been provided, as such it is not known whether there are any existing trees to be retained, and whether remediation considerations extend to these features. Once landscaping plans have been provided these will need to be reviewed and further investigation and risk assessment may be required.

Any revisions to the remediation strategy should be submitted to the local planning authority for their approval.

5.5 Tributary of the Lancing Brook

The removal of contaminated made ground soils in garden and soft landscape areas will provide betterment to the overall ground conditions and is anticipated to reduce the contaminant migration risk to the stream. However, at time of writing site drainage plans including the details relating to sustainable urban drainage have not been finalised. It is recommended that these documents are reviewed by Onyx Geo when they are completed and if new contaminant pathways are introduced as part of the drainage strategy, then this report should be updated to mitigate these risks.

We also recommend that a surface water management plan is developed for the site to minimise the risk during the construction / earthworks phase for surface water runoff and silts to adversely impact the watercourse.

5.6 PREVIOUSLY UNIDENTIFIED CONTAMINATION

The possibility remains that previously unidentified contamination may be present on site that could be encountered during the earthworks or construction phases. This may include soils exhibiting strong hydrocarbon odours [reports of fuel storage onsite]; buried tanks or structures / brickwork [report of a cess pit]; strongly discoloured soils; the presence of visible asbestos, such cement bonded sheets, asbestos insulation board, asbestos rope, or asbestos lagging; buried wastes; oily soils or free product (non-aqueous phase liquids).

In these instances where suspected or potential contaminated materials are encountered during any part of the earthworks or construction phase then the area should be secured to prevent exposure to the workforce from potentially contaminated land, the occurrence should be reported to the site manager, who should then liaise with the appointed environmental consultant. The regulator should be notified, and an investigation of the previously unidentified contamination undertaken to determine whether it is acceptable to continue the works or whether remedial action is required and if so in agreement with the statutory bodies.

It is also recommended that:

- Following demolition and asbestos strip out that the ground surface in the retained barns is inspected by the appointed environmental consultant to assess the impact from the demolition works on ground conditions and to confirm that absence of a vapour risks from the report of fuel storage.
- The ground is also inspected in the land west of unit 1 following vegetation clearance and topsoil strip to confirm the absence of gross contamination from the historical demolition and materials storage.

6 SITE CONTROLS

A site-specific working plan, method statements and risk assessments will need to be prepared by the contractor undertaking the remediation and/or groundwork stating a detailed methodology to achieve the measures proposed above. Specific methods are required for:

- Health and safety controls to be employed throughout the works.
- Actual remedial works to be undertaken (installation, use, monitoring, validation etc).
- Environmental preliminaries (controlling the generation of dusts, odours/gases and noise etc).
- Surface water management plan.
- Asbestos management; and
- Control of potential wastes.

6.1 ASBESTOS IN SOILS

The client, principal contractor and appointed sub-contractor/groundworker are responsible for complying with Control of Asbestos Regulations 2012 (CAR2012[2]). This includes (but not limited to) risk assessments compliant with CAR2012 regulation 6 and a plan of works compliant with CAR2012 regulation 7.

A plan of works is required when working in areas of known asbestos impacted soils and should include (but not limited to) details on: the nature and duration of the works; number of people involved; type of asbestos present; control measures to protect the workforce; and to prevent the release of fibres and / or tracking of asbestos in soils or asbestos fibres across the site; and the potential impact to adjacent land; the type of equipment including PPE/RPE; protecting / decontaminating those carrying out the work; protecting other people present at or near the work site.

6.2 WASTE MANAGEMENT

The principal contractor and appointed subcontractor undertaking earthworks / remediation and where waste is generated because of the work are responsible for compliance with waste regulations / legislation. This includes suitable characterisation of soils / materials that are anticipated as a waste, because of excavations for earthworks / site preparation / foundation or remediation.

Further testing and classification of waste generated from earthworks may be needed and should follow WM3[3]. The existing stockpiles have not been tested or classified for waste disposal.

[2]Guidance is provided in CAR-SOIL™ Control of Asbestos Regulation 2012 Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: Industry guidance by CL:AIRE dated 2016

[3] Guidance of the classification and assessment of waste (1st edition v1.2GB) Technical Guidance WM3 by EA/NRW/SEPA dated October 2021

We recommend that the contractor provides method statements illustrating how compliance with waste legislation will be achieved for waste materials generated through earthworks / foundation excavations and remediation to include, but not limited to:

- Use of imported materials.
- Criteria for assessing the suitability of imported materials (other than that specified in this document).
- Management of material that arises during the works and is classified as a waste, in particular waste materials generated from earthworks / remediation.
- How waste streams are appropriately tested and classified prior to offsite disposal.
- Process for selection of waste management contractors including assessment of licences, permits and registrations.
- Record keeping and audit procedures.

With respect to sourcing imported soils used in the clean cover system or soft landscaping no waste materials are permitted to be used.

A Definition of Waste: Code of Practice (DoW:CoP) materials management plan (MMP) should be prepared if the re-use of made ground soils onsite is considered, or suitable surplus natural soils are generated that may be donated to other sites.

Site won or imported materials will be either assessed under an approved DoW:CoP MMP or from a certified topsoil / subsoil supplier. Where the topsoil / subsoil is from a manufactured source the material must be prepared in accordance with suitable WRAP end of waste quality protocol or an environmental permit.

6.3 LONG TERM MONITORING AND MAINTENANCE

No long-term monitoring and maintenance are anticipated. However, it is envisaged that the site health and safety file will include all information pertaining to areas affected by ground contamination, including areas where historical made ground remains.

7 SUSTAINABILITY CONSIDERATIONS

7.1 CARBON REDUCTION

There is an urgent need to optimise redevelopment to significantly reduce the carbon footprint of the process without compromising the requirement for delivering a safe and suitable use of the site. With that in mind, there are several carbon reduction design tools available to the market. These provide information on the embodied carbon cost relating to earthworks and remediation techniques and encourage the conversation about carbon at an early stage in the design process. Consideration has been taken throughout this report to align the recommendations with climate protection, circular economy and sustainable use of materials.

7.2 SUSTAINABILITY CONSIDERATIONS

The geological, geotechnical and hydrological conditions of the site along with the potential for contamination can significantly influence the suitability of sustainable remediation options for the site.

Given the type of contamination, the size of the site and the proposed development it may be difficult to maximise the re-use of made ground soils onsite. With the exception of the natural soils encountered at depth, most of the soils on site would be classified as made ground and as such if any of these soils are to reused anywhere on site, including as sub-base to roads to carparks, their use would need to undertake under a Definition of Waste: Code of Practice (DoW:CoP) Materials Management Plan (MMP).

8 VERIFICATION REQUIREMENTS

8.1 SITE VALIDATION RECORDS

All remediation works are to be co-ordinated by the Principal Contractor and monitored by a suitably qualified and competent environmental consultant. The following records as a minimum (but not limited to) should be maintained:

- Records of all excavations including:
  - Ordnance datum surveyed extents and depths.
  - Description of ground conditions.
  - Photographic records.
  - Details of asbestos control measures.
- Formation level inspections particularly in the proposed gardens following removal of the made ground including:
  - Photographs.
  - Description of ground conditions.
  - Further sampling and laboratory testing as required.
- Clean cover system verification records:
  - Photographs.
  - Confirmation of depth of each layer.
  - Volumes of materials imported to site.
  - Laboratory testing certificates.
  - Details on source material.
- Definition of Waste Code of Practice (DoW:CoP)
  - If a DoWCoP MMP is developed for the site a separate verification report will be required by the person responsible for managing the records.

8.2 VALIDATION TESTING OF MADE GROUND

Where deep made ground soils (if present) are retained in private gardens and soft landscaped areas then verification testing of the top made ground layer is required at the following testing frequencies:

- Private gardens: three verification tests per garden area are required and tested for PAHs and asbestos.
- In soft landscaped areas outside of the garden areas: one test per 20 m^2 area footprint.

Side wall testing is not required. Results should be screened against the verification criteria specified in Appendix C.

8.3 VALIDATION TESTING OF IMPORTED OR PLACED SOILS

At this stage we have assumed that all soils in private gardens and soft landscaped areas will be imported.

If site won made ground soils are considered suitable for use on site, then a DoW:CoP MMP is needed prior to excavation. This section will also require updating to specify the testing and re-use criteria for made ground soils re-used on site.

Confirmation of the suitability of imported soils is the responsibility of the principal contractor / principal designer. Sources can be checked by the appointed environmental consultant prior to importation. Once confirmed as suitable the placed material should be tested at the following frequencies:

- Topsoil / subsoil used on site should be tested at a rate of one test per garden with a minimum of three tests per source.
- All imported soils are subject to the chemical test suite and verification criteria provided in Appendix C.

Depth checks of the placed clean cover system at the rate of approximately one inspection pit per private garden.

8.4 VERIFICATION REPORT

On completion of the remediation works and validation testing / inspection visits a verification report should be prepared and submitted to the local planning authority. The report should comprise:

- A summary of the information contained in the risk assessment report along with the agreed remediation strategy.
- Copies of decision records covering agreements with the regulators.
- Records of works undertaken and associated validation records (laboratory testing; drawings; photographs; earthworks records).
- Details of parties involved in the works.
- Third party reports (if any).
- Waste classification and management records (quantities of excavated soils; classification; disposal sites; waste transfer notes).
- Additional risks assessments / non-scheduled reactive works relating to previously unidentified contamination (if encountered) and all related remedial works that were undertaken; and
- Final status of remediation and achievement remedial objectives to satisfy planning conditions.

APPENDIX A – LIMITATIONS

This report, including any related study, inspection, testing, sampling, or interpretation (collectively referred to as "deliverables"), was prepared by Onyx Geo Consulting Limited (Onyx Geo), for the client specified in the first paragraph, following the terms outlined in Onyx Geo's fee proposal and standard terms (the "Appointment"). Onyx Geo delivered the Services with the level of expertise typical of geo-environmental consultants at the time. The report does not imply any specific fitness for purpose. The Services were completed within the limitations of scope, timing, and resources as agreed between Onyx Geo and the Client.

Except as specified above, Onyx Geo makes no further representations or warranties, either express or implied, concerning the Services. Liability for any actions related to this report expires six years from the report date or as legally specified, unless altered within the Appointment terms.

Onyx Geo conducted the Services exclusively for the Client's intended purpose. If this report or its contents are used by any third party without explicit written consent from Onyx Geo, any risk or liability lies solely with that party. It is recommended that third parties seek their own independent geo-environmental consultation.

The Client may not transfer or assign the benefits of this report to any third party without written permission from Onyx Geo. Should an assignment be agreed upon, any third-party rights provided will require a fee and will not extend beyond the terms initially agreed with the Client.

Onyx Geo understands this report is intended for the purpose outlined in its introduction. Any alterations in the site's intended use may invalidate the report. Onyx Geo is not liable for any use of this report outside its original purpose without a formal review.

Over time, changes in site conditions, regulations, technology, or economic circumstances may affect the accuracy or relevance of this report. For future reliance, written confirmation from Onyx Geo is advised.

The conclusions in this report are based on the specific Services provided as outlined in the Appointment. Onyx Geo holds no responsibility for undiscovered conditions that fall outside the scope of services originally agreed upon.

The Services were based on visible site conditions, historical site data, and publicly available information, relying on third-party data where applicable. Onyx Geo is not liable for inaccuracies in this information or for failing to independently verify third-party data.

Drawings included in this report are illustrative and may not be suitable for precise measurements. Marked features are approximate and for reference only.

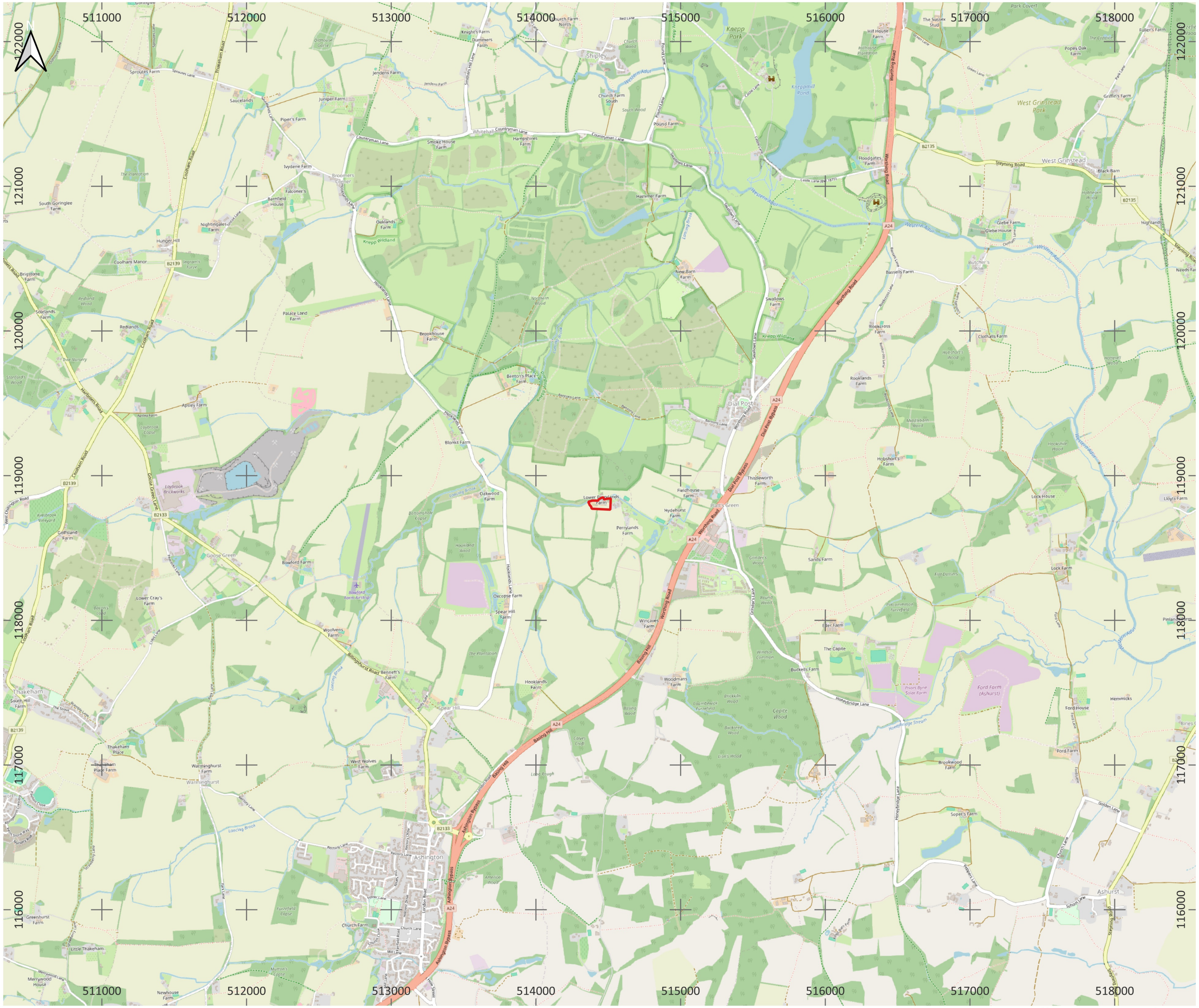
Any subsequent review or update of this report may require additional fees at the agreed rates.

The conclusions from ground investigations rely on samples taken from specific site locations and represent only a limited area around these points. Chemical analysis includes only parameters agreed upon with the Client.

Site conditions, particularly ground and groundwater variables, may change seasonally, and additional undisclosed contamination cannot be ruled out.

The presence of asbestos, if any, is not fully assessed within this report. A comprehensive asbestos survey is recommended for any thorough evaluation.

APPENDIX B – FIGURES AND DRAWINGS



Notes:

1. Do not scale drawings
2. All dimensions are in meters unless stated otherwise
3. The drawing is the property of Onyx Geo Consulting Ltd and is not to be used or the drawing copied, communicated or disclosed in whole or in part, except in accordance with a contract, license or agreement in writing with Onyx Geo Consulting Ltd

0 0.75 1.5 km

ONYXGEO
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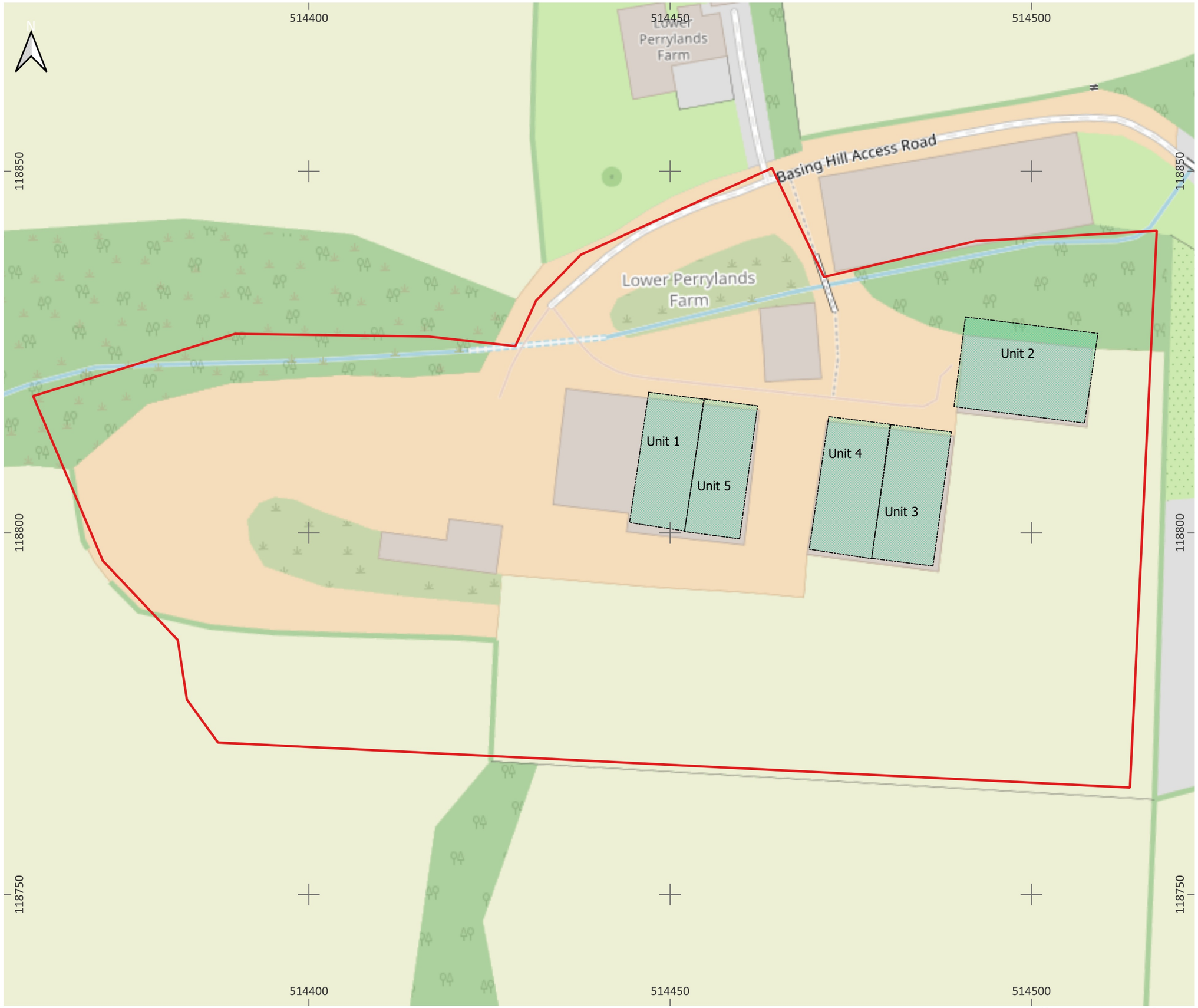
Project name:	Lower Perryland Farm
Client:	Lower Perrylands Ltd
Drawing No:	ON251042-ON-XX-XX-DR-G-111-C01
Description:	Figure 1 Site Location Plan
Project no: ON251042	Rev: C01
Date: 17/06/2025	Scale: 1:25,000

Drawn	Checked	Approved
MW	SC	ADC



Notes:

1. Do not scale drawings
2. All dimensions are in meters unless stated otherwise
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Project name:
Lower Perryland Farm

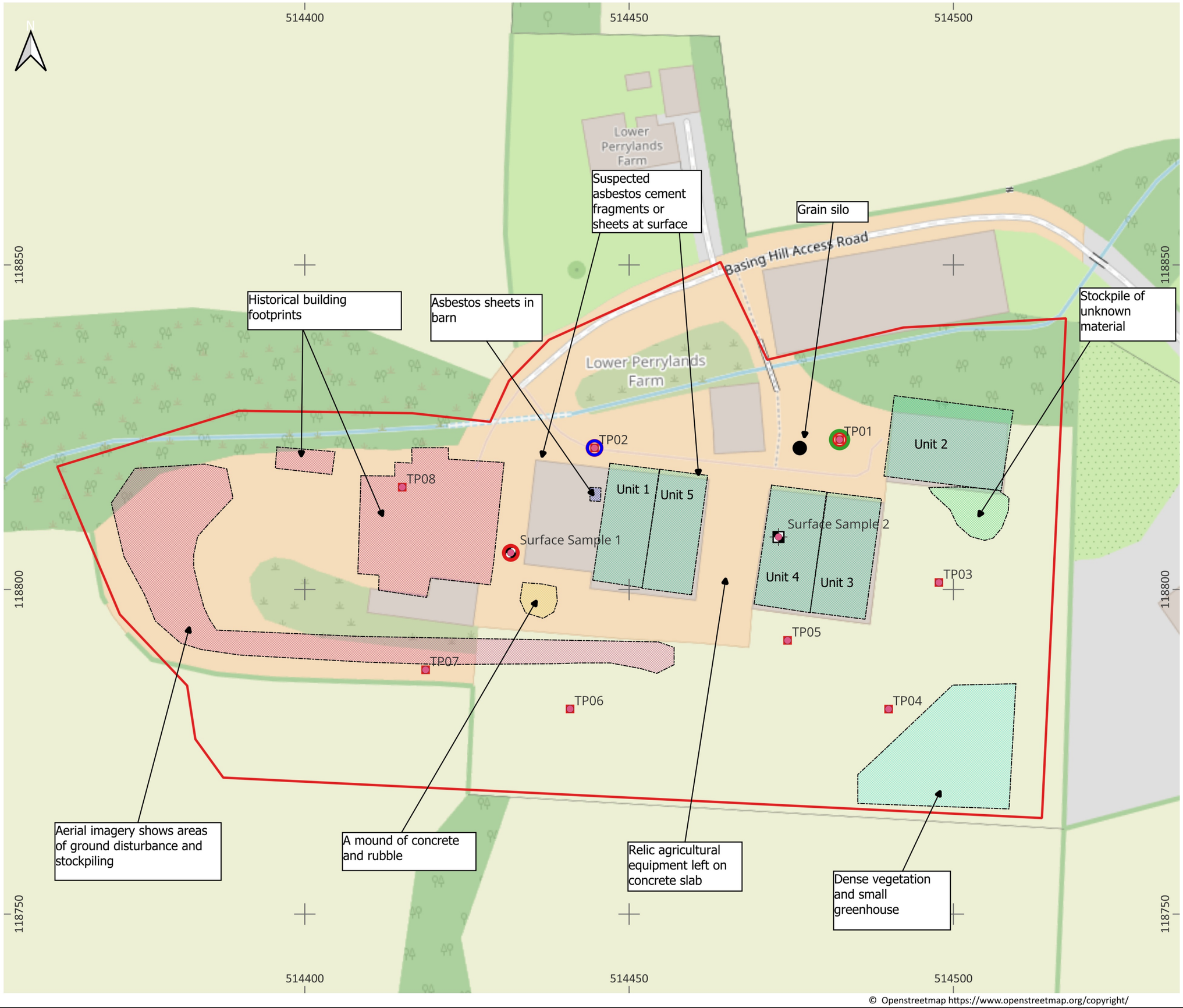
Client:
Lower Perrylands Ltd

Drawing No:
ON251042-ON-XX-XX-DR-G-112-C01

Description:
Figure 2 Site Layout Plan

Project no:	Rev:
ON251042	C01
Date: 17/06/2025	Scale: 1:500

Drawn	Checked	Approved
MW	SC	ADC



Notes:

1. Do not scale drawings
2. All dimensions are in meters unless stated otherwise
3. The drawing is the property of Onyx Geo Consulting Ltd and is not to be used or the drawing copied, communicated or disclosed in whole or in part, except in accordance with a contract, license or agreement in writing with Onyx Geo Consulting Ltd

Detects above assessment criteria

- Asbestos fragments
- Asbestos fibres
- PAHs

0 10 20 m

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Project name:	Lower Perryland Farm
Client:	Lower Perrylands Limited
Drawing No:	ON251042-ON-XX-XX-DR-G-113-C01
Description:	Figure 3 Constraints plan
Project no:	ON251042
Rev:	C01
Date:	17/06/2025
Scale:	1:550
Drawn	MW
Checked	SC
Approved	ADC

APPENDIX C – IMPORTED FILL REQUIREMENTS

C.1 Chemical Test Specification

Table C.1: Test Compounds and Verification Criteria

Compound	Verification Criteria (mg/kg)	
	Deep made ground	**Imported topsoil / sub soil**
Arsenic	n/r	37
Cadmium	n/r	11
Chromium (III)	n/r	910
Chromium (VI)	n/r	6
Copper	n/r	135*
Lead	n/r	200
Mercury (inorganic)	n/r	40
Nickel	n/r	75*
Selenium	n/r	250
Zinc	n/r	200*
Benzo(a)pyrene	5.0 (C4SL) as surrogate marker for PAHs	0.79**
Naphthalene	15 (C4SL)	2.3
pH	n/r	6-9
Asbestos	No asbestos detected	No asbestos detected

* based on plant phytotoxicity for multipurpose topsoil pH6-7, as per BS3882:2015' ** Benzo(a)pyrene as a surrogate marker for genotoxic PAHs. Alternative PAHs may be considered subject to agreement with LPA, including benzo(a)pyrene based on SOM or use of C4SL; n/r = not required as the 2025 Phase II site investigation did not find these compounds to contaminants of concern at the site.

C.2 Material Quality

Onyx Geo Consulting Ltd anticipate that two types of imported materials will be used in the clean cover system, namely topsoil and subsoil. The thicknesses of the placed materials are as defined in the main body of this report. However, the minimum thickness of placed topsoil is expected to be 150 mm to a maximum thickness of 300 mm. The remainder to be formed of suitably compliant subsoil or deter to dig layer if required.

It is recommended that in addition to the Table C.1 above that the imported topsoil / subsoil meet the requirements as specified in BS3882:2015 Specification for topsoil and

BS8601:2013 Specification for subsoil and requirements for use. Further testing than that detailed in Table C.1 may be necessary.

We note that should a compound tested exceed the test criteria then it shall be deemed not acceptable for use on site. In addition, the following shall be deemed non-compliant materials:

- Soils containing visible anthropogenic materials (plastic, glass, metal, brick, concrete etc)
- Peat or materials from swamps marshes and bogs
- Logs, stumps and perishable materials
- Material susceptible to spontaneous combustion
- Clay having a liquid limit determined in accordance with BS17892-12:2018; exceeding 90% or plasticity index determined in accordance with BS17892-12:2018, exceeding 65%.

C.3 Subgrade preparation and formation level inspection.

All pile mat, scaffold base and/or waste materials must be removed in their entirety from the surface of areas to become gardens or public open space / soft landscaping prior to the application of clean cover soils. This aspect of the works will be inspected and validated by the Engineer.

Subject to what is detailed above, the formation level should be inspected and records maintained prior to the placement of the imported material. This may include formation level testing to confirm removal of deleterious material (subject to the specifications detailed in the main body of the report). Sufficient time should be allowed for the appointed person to undertake the inspections and testing (if necessary).