**ROY BENSON**



OAKFIELD, COOLHAM ROAD, COOLHAM,
HORSHAM, RH13 8QE

# Preliminary Contamination Risk Assessment

October 2025

eas ltd
Environmental Assessment Services Ltd

# REPORT DATA SHEET

| Requirement | Data |
|---|---|
| Report Ref: | 851/Prowe/Oakfield/CRA |
| Date | November 2025 |
| Client | Roy Benson |
| Report type | Contamination Risk Assessment |
| Purpose | Planning Application |
| Revisions | - |
| Prepared by | Xanthe Lyford BSc (Hons)  |
| Approved by | Eur Ing Malcolm McKemey BSc (Hons), CEng, CEnv, MICE, MIEAust, MCIWEM, MIEnvSc  |

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**Contamination Risk Assessment**

November 2025

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**Contamination Risk Assessment**

October 2025

## 1. BACKGROUND

1.1 The site is comprised of the farmyard and several agricultural buildings proposed for redevelopment as residential accommodation. The previous and existing use of the site and the adjoining land have some contamination potential which could affect the proposed development. A Preliminary Contamination Risk Assessment (PCRA) was carried out in May 2023 (Environmental Assessment Services Limited), which recommended a Phase 2 intrusive site investigation, including soil analysis and asbestos survey. Prior approval has been sought and granted with conditions including the requirement to provide a site investigation to identify risks associated with contamination (Condition 1). In response a Contamination Risk Assessment (CRA) has been undertaken to assess the potential risk to future site users and the wider environment.

1.2 This CRA included reference to the previous PCRA, to identify potential areas of contamination. Six trial pits were excavated at locations where there was potential for exposure of future residents to contamination. Soil samples from the trial pits were sent for analysis.

## 2. THE SITE & PROPOSED REDEVELOPMENT

1.1 The site comprises the farmyard and several agricultural buildings associated with Oakfield, Coolham Road. The site lies approximately 2 km south of Coolham, and 12 km southwest of Horsham. The site area is approximately 0.31 ha. The Ordnance Survey (OS) map reference for the site is TQ11461 20627. See Figure 1 in Appendix A for the site location plan and Figure 2 for the site as existing.

1.2 It is proposed to redevelop the site for residential use. There are two planning applications recently submitted for the site with prior approval, subject to conditions. This report addresses Condition 1(a) for both applications.

- DC/20/2457, ‘Prior notification for change of use of agricultural building to a single dwellinghouse (Class C3).’ approved on 05/02/21.

- DC/21/0871, ‘Prior approval for change of use from an agricultural building to residential (C3 Use Class) to form 3No. dwellings.’ approved on 14/05/2021.

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See Figure 3 in Appendix A for the proposed development plans.

## 3. GEOLOGY & HYDROGEOLOGICAL CONSIDERATIONS

3.1 According to the British Geological Survey (available online), the site lies partially upon Weald Clay Formation – Mudstone, and partially upon Weald Clay – Sandstone.

3.2 The Department for Environment, Food and Rural Affairs (Defra) online mapping (MAGIC) shows the site to lie partially upon Unproductive Strata (Weald Clay Formation - Mudstone), and partially upon Secondary A Aquifer (Weald Clay Formation - Sandstone), which has a groundwater vulnerability rated as high. The site does not lie within a groundwater Source Protection Zone (SPZ).

3.3 According to the Environment Agency's (EA) online Flood map for planning, the site lies within Flood Zone 1 (low risk of flooding from rivers and/or the sea). The site does not lie within 500 m of a watercourse classified as a main river by the EA. Surface water flood risk is shown as very low across the site, with a small area at low risk associated with the ditch adjacent to the east of the site.

## 4. POTENTIAL SOURCES OF CONTAMINATION

4.1 The site was initially visited by Environmental Assessment Services Ltd on 18th May 2023 as part of the Preliminary Contamination Risk Assessment. A superficial examination of the site was carried out, and the land use history of the site was reviewed from an environmental records search plus analysis of historic maps and the previous planning history. The PCRA recommended testing of soil in proposed garden and soft landscaping area as these are the locations where future site users are likely to have contact with the soil.

4.2 The site was subsequently visited by Environmental Assessment Services Limited on 15 October 2025 as part of the Contamination Risk Assessment and samples of soil from the garden and soft landscaping areas of the proposed development taken for laboratory analysis. No groundwater was encountered.

4.3 The site comprises four agricultural buildings, a residential dwelling, a central yard and access and an area of mown lawn to the north.

4.4 The site is accessed via a metal gate from Coolham Road within the southeast corner of the site. The access, parking areas and yard are laid to concrete with some evidence of wear and cracking.

4.5 An Atcost Barn lies centrally within the south of the site. This comprises a concrete frame, with block lower elevations and corrugated cement fibre (suspected asbestos) roof cladding with GRP skylights. The floor is laid to concrete with some mild cracking and staining. Externally to the east of the site is a propane tank and manhole.

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4.6 The southwest of the site is occupied by two adjoined barns and a third open-sided barn. The adjoined barns are single storey and timber framed with galvanised steel reinforcements, partial corrugated galvanised steel sheet and partial suspected asbestos fibre cement roofing with GRP skylights and brick facades; the floor is laid to concrete.

4.7 The southern barn appears to have been used for vehicle maintenance with significant staining on the floor.

4.8 The central barn is larger. The eastern side is used for domestic storage. The western side may have previously housed animals. An external area can be accessed through the building to the west. This was used for further storage.

4.9 The northern barn is an Atcost-type with steel frame and profiled coated steel roof, with a partial concrete floor and partial earth floor.

4.10 To the north of the yard area is a single storey dwelling with painted/textured timber board elevations, a tiled roof, with a brick base and a concrete plinth. Fruit trees lie in the garden area adjacent and to the east. A sewage chamber lies adjacent to the southeast corner which connects to a sewage treatment plant (Klargester type) within the vegetated eastern boundary, treated effluent discharging to the adjacent ditch.

4.11 The north of the site comprises a garden area, with regularly mown lawn bordered to the west by oak trees and to the east by a hedgerow with trees and adjacent bramble scrub.

4.12 An area within the southeast of the garden adjacent to the access gateway has been cleared and the vegetation removed.

4.13 Potential sources of contamination identified during the site walkover assessment included:

i. Potential contamination risks associated with previous/historic land use (agricultural, storage – including storage of potentially contaminating fluids, oils and fuels plus historic burning of waste) including Polycyclic Aromatic Hydrocarbons (PAHs) from fires, ash and clinker, old tarmac, and petroleum hydrocarbons from the usage and storage of fuels and lubricants within the site, and possible storage and use of pesticides.

ii. Possible contamination from current or recent land uses includes use and storage of fuels, hydraulic oils, lubricants, solvents and potential leakage of sulphuric acid from batteries in old vehicles stored throughout the site. There was evidence of a bonfire within the southeast Atcost-type barn, which lies upon a partial earth and partial concrete floor, and evidence of mild to significant hydrocarbon staining on the concrete hardstanding areas across the site, the depth of penetration of which is uncertain.

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iii. Given the age and history of the site, there was considered to be potential for asbestos containing materials to be present in any infilled land, building imported subbase materials and as a result of previous renovation or demolition works. The roofing within the central Atcost barn and the south-eastern barns is suspected to be asbestos fibre cement. Professional removal is required, an asbestos survey will need to be conducted at the site.

iv. Potential off-site sources of contamination within the surrounding area include current and historic activities (agricultural, storage, vehicle maintenance/storage, workshops) within adjacent buildings at the neighbouring Hungerhill Barn.

v. The PCRA did not identify any historic/current landfills or waste processing within 1000 m of the site.

## 5. THE SITE INVESTIGATION

5.1 The objectives of the site investigation were to confirm the nature of the underlying soil and to establish whether the former land uses had resulted in contamination of soil or groundwater at the site.

5.2 The site investigation was carried out on 15th October 2025 and comprised the excavation of six trial pits to a depth of approximately 0.4 m. The trial pits allowed visual inspection of the underlying soil as well as the selection of samples for analysis. The underlying soil beneath the made ground appeared to be uncontaminated clayey substrate.

5.3 The trial pits were positioned in areas of proposed soft landscaping and garden areas. Trial pits 1 and 2 were located in the overgrown garden/orchard area at the north side of the Atcost barn on the northwest and northeast corner respectively. Trial pit 3 was located on the grassed area to the east of the track, opposite the existing dwelling and trial pits 4, 5 and 6 were located in the grassed area to the east of the site, parallel with the public highway (to remain as soft landscaping post development). See Figure 2 for the location of the trial pits.

5.4 In each location a trial pit of approximately 30 cm in width and 40 cm in depth was excavated. Each location had significant topsoil, overlying visible clayey substrate. No groundwater was encountered in any of the trial pits.

i. Trial pit 1 was located to the northwest of the Atcost barn, within the garden/orchard area, and proposed garden. The trial pit revealed a layer of topsoil over made ground consisting of broken clay (likely from when the original barn was built). Soil samples were taken from the made ground, at a depth of 0.1 m - 0.4 m and from the natural strata.

ii. Trial pit 2 was located to the northeast of the Atcost barn, also within garden/orchard area, and proposed garden. The trial pit revealed a layer of topsoil measuring approximately 0.2 m over made ground. Soil samples were taken from made ground at a depth of 0.1 m - 0.4 m and from the underlying strata.

iii. Trial pit 3 was located to the east of the track, in the grassed area opposite the existing dwelling. This trial pit revealed a layer of topsoil over clay underlying strata. Soil samples were taken from a depth of 0.1 m - 0.4 m.

iv. Trial pit 4 was located to the north of the entrance gateway with Coolham Road in the grassed area (recently cleared of vegetation). This trial pit revealed a layer of topsoil over clay underlying strata. Soil samples were taken at depths of 0.1 m and 0.4 m.

v. Trial pit 5 was located to the north of trial pit 4 in the grassed area, adjacent to the proposed parking (recently cleared of vegetation). This trial pit revealed a layer of topsoil over clay. Soil samples were taken from a depth of 0.1 m - 0.4 m.

vi. Trial pit 6 was located to the north of trial pit 5 in the grassed area opposite the turning area to the north of the existing dwelling. This trial pit revealed a layer of topsoil over clay underlying strata. Soil samples were taken from a depth of 0.1 m - 0.4 m.

5.5 The trial pit locations are shown in Figure 2. Photographs taken during the site investigation are provided in Appendix B.

5.6 A total of 18 soil samples were sent to i2 Analytical Ltd of Croxley Green, Watford, for analysis. All the samples were tested for speciated Polycyclic Aromatic Hydrocarbons (PAHs), petroleum hydrocarbons, toxic and phytotoxic heavy metals / metalloids, water soluble sulphate, pH, soil inorganic matter, and asbestos.

5.7 Copies of the sample analysis certificates, together with the laboratory's methods and accreditations, are given in Appendix C.

## 6. INTERPRETATION OF RESULTS

6.1 The investigation confirmed that made ground was present in the areas around the Atcost barn (the areas covered by trial pits 1 and 2), this predominately comprised a layer of broken clay in the grounds of the residence and adjacent to the barn.

6.2 The results of the soil sample analysis have been compared with the threshold values for residential use without homegrown produce as published in the LQM/CIEH Suitable for Use Levels (S4UL) for Human Health Risk Assessment (2015). Copyright Land Quality Management Limited reproduced with permission; Publication Number: S4UL3601. All rights reserved.

6.3 Asbestos was not detected within the upper soil samples tested from trial pits 1-6.

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6.4 The pH of the soil samples ranged from 5.9 – 7.8 acidic to neutral. No measurable concentrations of cyanide were identified within any of the soil samples analysed.

6.5 Moderate Heavy Metal concentrations were found across the upper and lower soil samples of trial pits 1-5. Elevated levels of Boron (water soluble) were identified within all trial pits, falling within the threshold range. This is possibly due to previous use of fertilisers on site.

6.6 No elevated levels of Aliphatic Petroleum Hydrocarbons were identified within the soil samples from the trial pits. The concentrations threshold values for residential use for EC 10-12 are 330 mg $Kg^{-1}$ DW for trial pit 5 and 760 for the other trial pits (the values are dependent on the amount of organic content present in the sample).

6.7 No elevated levels of Aromatic Petroleum Hydrocarbons were identified within the samples from the trial pits. The concentration threshold values for residential use for EC 10-12 being 180 mg $Kg^{-1}$ DW for trial pit 5 and 380 for the other trial pits (as above, the values are dependent on the amount of organic content present in the sample).

6.8 Elevated concentrations of Polycyclic Aromatic Hydrocarbons (PAHs) were identified within the soil samples from trial pits 1 and 2. Concentrations of PAHs in excess of the Soil Guideline Values (SGVs) were identified in the soil samples taken from trial pits 1 and 2, specifically: raised levels of Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenz(a,h)anthracene in trial pits 1 and 2. PAH's occur in coal fire waste, oil and in other hydrocarbon-based materials like bitumen, coal tar and creosote. It is likely that the substances identified in the soil samples are present as a result of previous agricultural use of the site as a barn used to store and maintain farm vehicles.

6.9 Concentrations of contaminants in excess of the threshold values for residential use without homegrown produce were identified in the soil samples taken from trial pits 1-3.

6.10 No groundwater was encountered during the site investigation.

6.11 Based on the analysis of soil samples taken from the six trial pits, it is concluded that there is some contamination of the superficial ground layers at trial pits 1, 2 and 3 around the barn and residence, consequently it will be necessary to remediate or remove some of the existing soil in order to render it suitable for gardens or soft landscaping in a residential lands use.

## 7. RISK ASSESSMENT

7.1 The Contamination Risk Assessment has been prepared in accordance with current standards and recommendations.

7.2 For contamination to be significant, there must be three elements present: *contamination* (a substance that has the potential to cause harm or cause

pollution of controlled waters), a *receptor* (something that could be adversely affected by a contaminant) and a feasible *pathway* (route or means) between substance and receptor. See Figure 4 below:

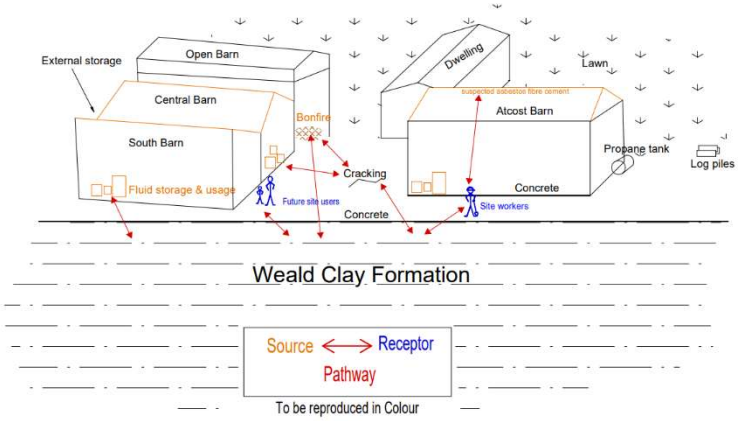


FIGURE 4: CONCEPTUAL MODEL

7.3 The model may be applied to four cases:

i. Construction workers engaged in the redevelopment of the site and exposed to contamination. The receptor assumed to be an adult.

ii. Future site users on the site after the redevelopment is complete. The receptor is assumed to be a child.

iii. Post-redevelopment impacts on buildings and services, including water supply pipes.

iv. Post-redevelopment impacts on the wider environment. Includes off-site contamination migration, contamination of watercourses, etc.

7.4 In this case, contamination has been identified in the samples of soil taken from trial pits 1-3. Upper soil samples were taken at depths of 0.1 m to 0.4 m.

7.5 **Exposure during construction**

7.5.1 Those appointed to undertake site clearance and groundworks may be exposed to any asbestos containing material within the barn structure. Recommendations given in this report, including proper removal and disposal of these materials, should be adhered to.

7.5.2 Soil remediation will be required in the areas surrounding the barn. This may include on-site remediation of the soils and/or soil removal. Site workers are likely to be exposed in either case.

7.5.3 Exposure to soil contaminants is most effectively addressed by appropriate industrial hygiene when the surface soil and made ground is handled during site clearance and groundworks. Measures should include the wearing of boots

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gloves and coveralls, and dust masks (particularly on dry days) wherever dust is generated. Eating and smoking in excavations should be avoided.

### 7.6 Exposure of residents on the site after redevelopment

7.6.1 The site is to be redeveloped for residential use including areas of soft landscaping and garden areas.

7.6.2 In the absence of remediation, future site users may be exposed to contaminants within the soil via inhalation, dermal contact, and consumption.

7.6.3 Remediation of the soils within the garden and soft landscaping areas of the site will be required in this case before the site can be considered fit for residential use. Remediation should include the removal of upper soils surrounding the barn to allow for a minimum of 600 mm of clean topsoil to be laid above a permeable geotextile membrane. See recommendations in Section 9.

### 7.7 Post-redevelopment risks to buildings, services, and the wider environment

7.7.1 There are no particular concerns regarding sulphate concentrations in relation to building foundations etc. No new buildings are proposed, only the conversion of existing.

7.7.2 Migration of contamination off site is considered possible, however, migration is considered to be limited to made ground as evidenced by the contamination being found only in the areas of made ground around the barn.

7.7.3 The site has high groundwater vulnerability but does not lie within a groundwater Source Protection Zone and is not within an area which is considered to be hydrogeologically sensitive. In this case, the proposed residential redevelopment of the site is not considered likely to pose a risk of contamination to the wider environment.

## 8. CONCLUSIONS

8.1 The site lies partially upon Weald Clay Formation – Mudstone (Unproductive Strata), and partially upon Weald Clay – Sandstone (Secondary A Aquifer). The site does not lie within a groundwater Source Protection Zone and is considered to be only moderately hydrogeologically sensitive.

8.2 According to the EA's online Flood map for planning, the site lies within Flood Zone 1 (low risk of flooding from rivers and/or the sea). The site does not lie within 500 m of a watercourse classified as a main river by the EA.

8.3 A Contamination Risk Assessment, including an intrusive site investigation, is required to satisfy Condition 1 of the prior approval planning permission for redevelopment of the site for residential use.

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8.4 The intrusive site investigation was undertaken on 15th October 2025. The investigation comprised the excavation of six trial pits distributed across the site in the proposed soft landscaping and garden areas. A total of 18 soil samples were taken and sent for analysis by I2 Analytical.

8.5 The sample results were compared against the LQM Category 4 Screening Levels (C4SL, updated 2014) and LQM/CIEH Suitable for Use Levels (S4UL) for Human Health Risk Assessment (2015), for residential end use.

8.6 The analysis of soil taken from the six trial pits, positioned strategically within the site, identified some elevated levels of concentrations of PAHs within the soil samples taken from trial pits 1 and 2 and petroleum hydrocarbons in trial pits 1-3. No groundwater was encountered.

8.7 Former land use comprised agricultural fields/farmyard/agricultural buildings, and more recently is suspected to have included vehicle maintenance/repair. This may have included the burning of waste and storage and usage of maintenance fluids, oils and fuels, plus suspected asbestos cement within the Atcost barn and southeastern barns.

8.8 The roofing within the central Atcost barn and the southeastern barns is suspected to be asbestos fibre cement. This will need to be confirmed by an asbestos survey.

8.9 Some aromatic petroleum hydrocarbon contamination was identified within the sample of trial pits 1, 2 and 3. Significant PAH contamination was identified within the samples of trial pits 1, 2 and 3. This contamination is considered likely to pose a risk to future residential site users. Soil remediation will be required.

8.10 The presence of contamination within the soil may also pose a potential risk to water mains. If new water connections are to be laid, results of the soil testing should be reviewed against current UKWIR guidance, and barrier pipe may be required for new water mains.

8.11 It is proposed to convert the existing building on site to residential use, with surrounding hardstanding and soft landscaping. Subject to compliance with the recommended soil remediation measures and worker safety precautions, the site will not pose a risk to groundworkers, site users, buildings, services, or the wider environment. In this respect, the area sampled is suitable for residential end use according to the LQM/CIEH Suitable for Use Levels (S4UL).

8.12 The overall environmental risk for the site is rated according to the risk assessment matrix in Table 8.1 below:

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TABLE 8.1
RISK ASSESSMENT MATRIX

| PROBABILITY OF IMPACT | CONTAMINATION POTENTIAL | | |
|---|---|---|---|
| | SEVERE | MODERATE OR UNCERTAIN | MINIMAL |
| High | 4 | 3 | 2 |
| Medium | 3 | 2 | 1 |
| Low | 2 | 1 | 1 |

1 = low risk, 2 = low to medium risk, 3 = medium to high risk, 4 = high risk

8.13 In this case, some contamination within the soil layers surrounding the Atcost barn has been identified. In the absence of mitigation, the probability of impact would be high for residential use with gardens in an area that is not hydrogeologically sensitive. Protection and remediation works will be required as part of the site's redevelopment before the site could be considered appropriate for residential use. Subject to remediation measures recommended below, the environmental risk rating would be reduced to 1 (low).

## 9. RECOMMENDATIONS

9.1 An asbestos survey will need to be carried out to ascertain if the roofing within the central Atcost barn and the southeastern barns are asbestos fibre cement. Appropriate removal and disposal will be required should this be confirmed.

9.2 Some contamination has been identified within the upper soil samples of trial pits 1 – 3, namely aromatic petroleum hydrocarbons within trial pits 1-3 and PAHs within trial pits 1 and 2.

9.3 It is recommended that soil within the areas of proposed soft landscaping or garden surrounding the barn is removed to a depth of 0.6 m and replaced with clean topsoil from an uncontaminated source laid on a permeable geotextile.

9.4 These recommendations form the basis of a remediation strategy to permit the site's redevelopment for residential use.

9.5 The presence of PAHs within the soil on the site may affect any new underground plastic (PE and PVC) water supply pipework. If new pipes are to be laid, analysis results should be reviewed against current UKWIR guidance, and barrier pipe may be required.

9.6 Waste Acceptance Criteria (WAC) testing may also be required where soils are to be removed from the site. All waste soil should be appropriately disposed of offsite based on the findings of WAC testing.

9.7 All site workers including groundworkers engaged in the removal of, or working within, the existing upper soil should practice appropriate industrial hygiene. Measures should include the wearing of boots, gloves and coveralls, and dust masks (particularly on dry days) wherever dust is generated. Eating and smoking in excavations should be prohibited.

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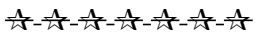
9.8 A verification report may be required to confirm that the recommended remediation works have been completed on site, and to confirm that the site has been rendered as suitable for residential use. This report should include evidence that the remediation has been carried out as recommended, and should include the results of any further testing, photographs of the work in progress, documentary evidence of the origin of the replacement topsoil and copies of the tickets for material disposed of off-site.



## APPENDIX A

Figure 1: **Location Plan**
Figure 2: **Existing Site Layout and Trial Pit Locations**
Figure 3: **Proposed Redevelopment**
Figure 4: **Conceptual Model (in text)**

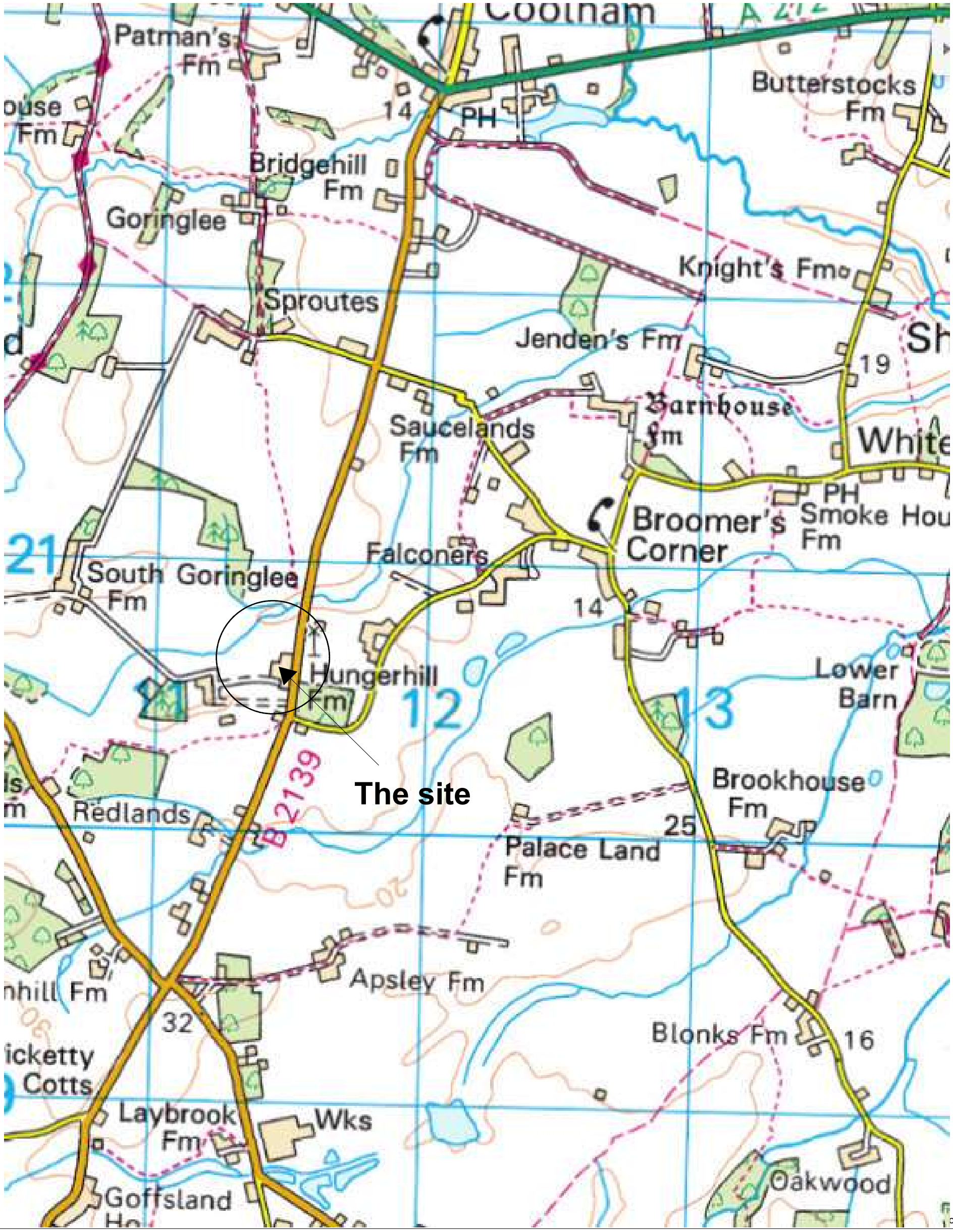



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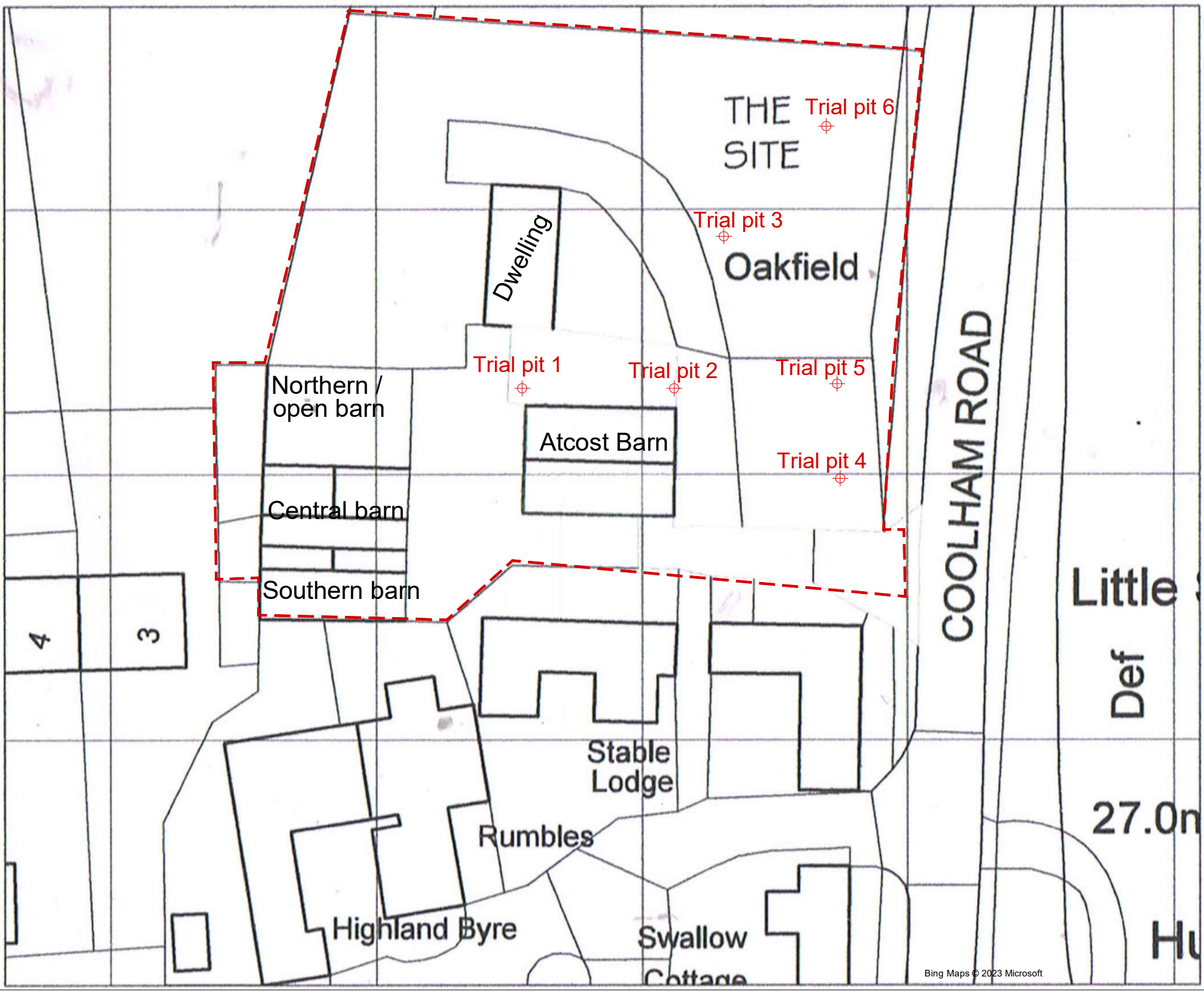
**Figure 1: Site Location**

October 2025




**ALEX ALLEN**

OAKFIELD, COOLHAM ROAD, COOLHAM,

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**Figure 2: Existing Site Layout and Trial Pit Locations**

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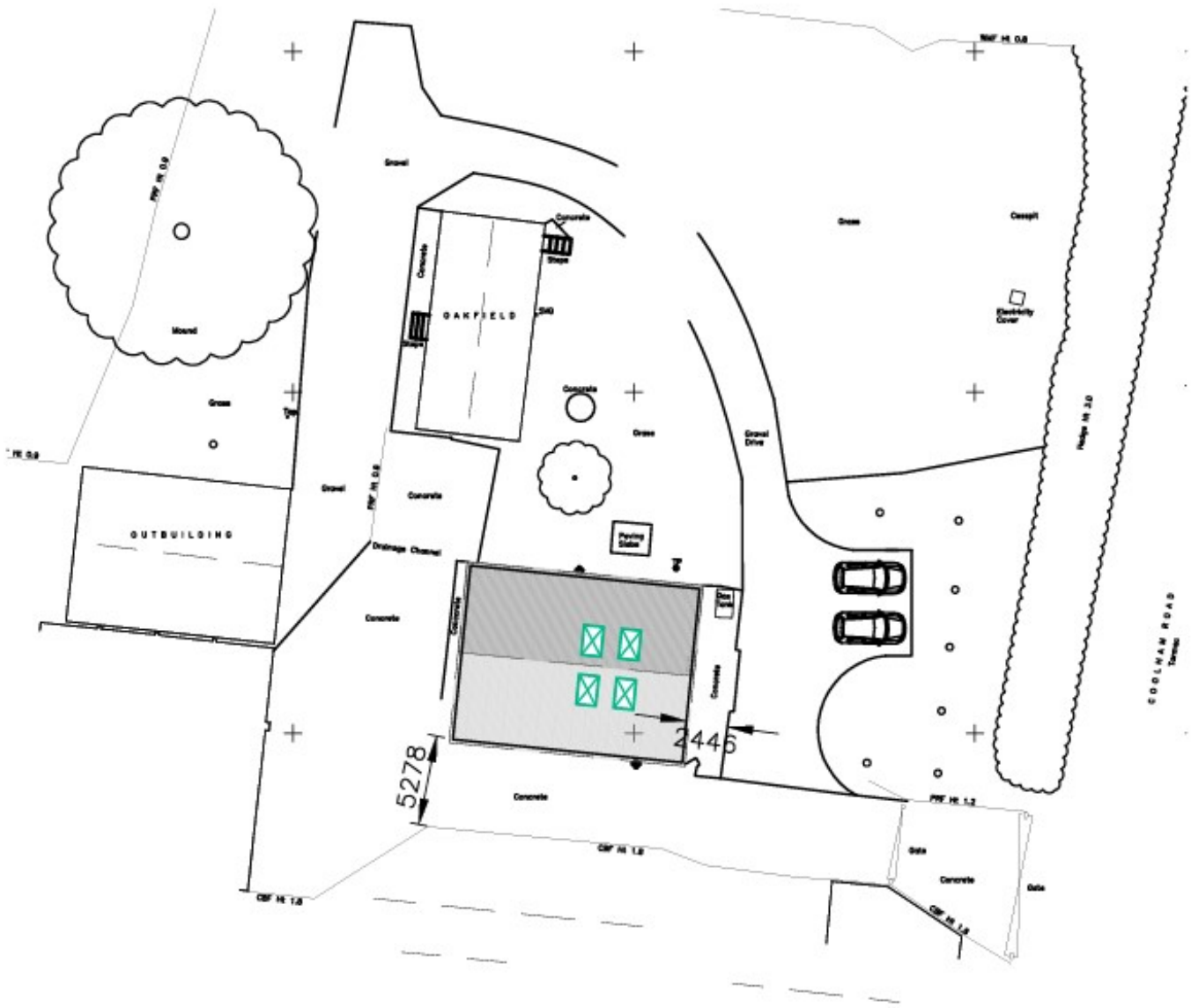


# BLOCK PLAN 1:500

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**Figure 3: Proposed Redevelopment**

October 2025

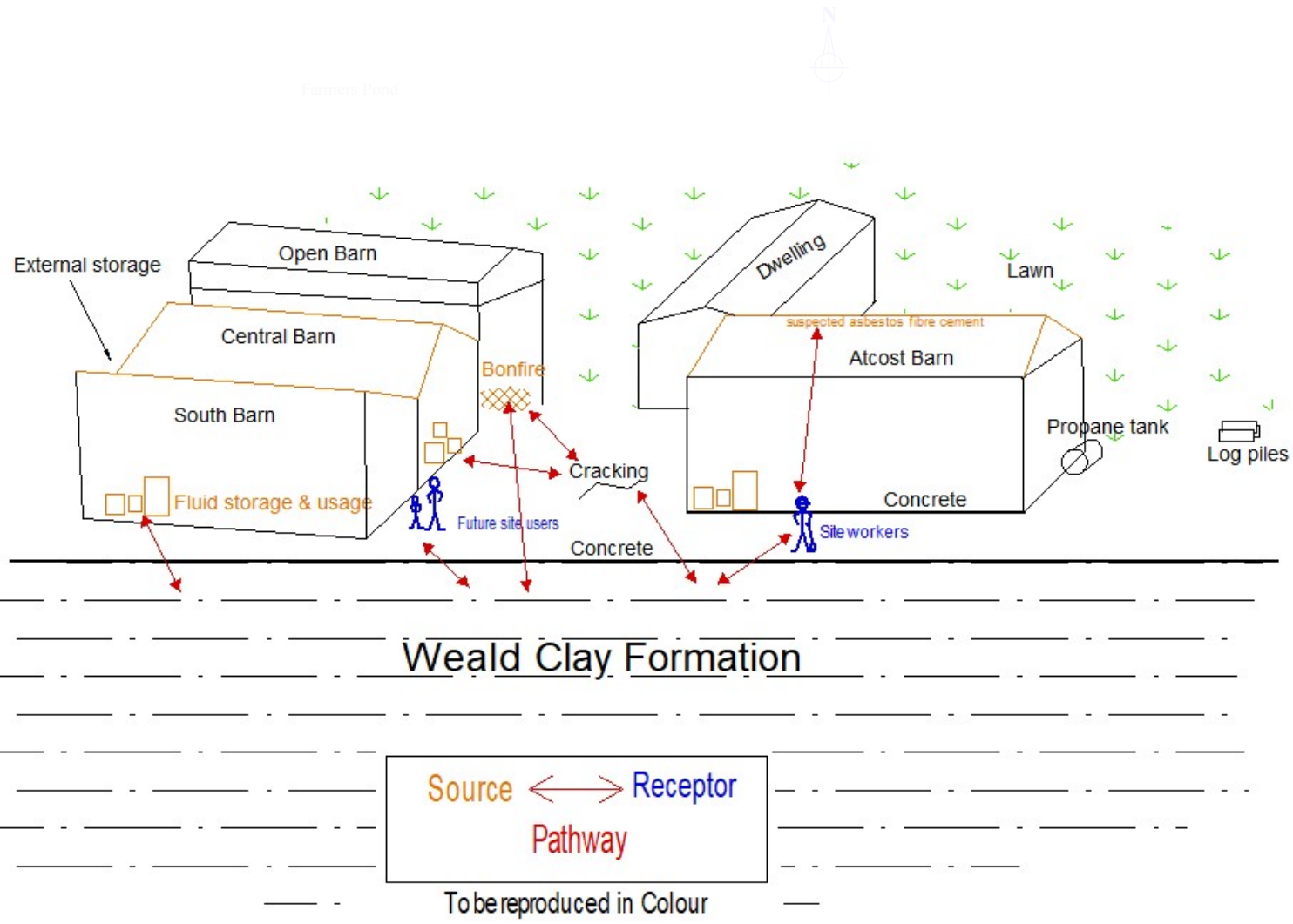


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**Figure 4: Conceptual Model**

October 2025

APPENDIX B:

**Photographs**

Atcost barn eastern façade



Atcost barn western façade



The Existing dwelling southern façade



Location of trial pit 1



Location of trial pit 2



Location of trial pit 3



Location of trial pit 4



Location of trial pit 5



Location of trial pit 6



APPENDIX C:

**Analysis Certificates**

Environmental Assessment Services Ltd
London Road
Hickstead
Haywards Heath
West Sussex
RH17 5LZ

t:

e: info@easltd.co.uk

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

t: 01923 225404
f: 01923 237404
e: info-i2analytical@normecgroup.com

# Analytical Report Number : 25-057348

| | | | |
|---|---|---|---|
| **Project / Site name:** | Oakfield | **Samples received on:** | 22/10/2025 |
| **Your job number:** | 851 | **Samples instructed on/ Analysis started on:** | 22/10/2025 |
| **Your order number:** | EAS 2025 851 1 | **Analysis completed by:** | 03/11/2025 |
| **Report Issue Number:** | 1 | **Report issued on:** | 03/11/2025 |
| **Samples Analysed:** | 6 soil samples | | |

**Signed:**

Anna Goc
PL Head of Reporting Team
**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 |
| air | - once the analysis is complete |

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 25-057348**
**Project / Site name: Oakfield**
**Your Order No: EAS 2025 851 1**

| Lab Sample Number | | | | 725267 | 725269 | 725270 | 725271 | 725272 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP1 | TP2 | TP3 | TP4 | TP5 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A | N/A | N/A |
| Depth (m) | | | | 0.10-0.40 | 0.10-0.40 | 0.10-0.40 | 0.10-0.40 | 0.10-0.40 |
| Date Sampled | | | | 15/10/2025 | 15/10/2025 | 15/10/2025 | 15/10/2025 | 15/10/2025 |
| Time Taken | | | | 1320 | 1325 | 1330 | 1335 | 1340 |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | | | |
| Stone Content | % | 0.1 | NONE | 14.8 | 4.5 | < 0.1 | 1.1 | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 23 | 28 | 20 | 9.9 | 22 |
| Total mass of sample received | kg | 0.1 | NONE | 0.7 | 0.7 | 0.8 | 0.7 | 0.9 |
| **Asbestos** | | | | | | | | |
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | OGR | OGR | OGR | OGR | OGR |
| Analysis completed | N/A | N/A | N/A | 31/10/2025 | 31/10/2025 | 31/10/2025 | 31/10/2025 | 31/10/2025 |
| **General Inorganics** | | | | | | | | |
| pH (L099) | pH Units | N/A | MCERTS | 7.4 | 7.5 | 6.8 | 7 | 7.8 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 69 | 64 | 36 | 250 | 91 |
| Water Soluble $SO_4$ 16hr extraction (2:1) | mg/l | 1.25 | MCERTS | 34.3 | 32 | 18.1 | 125 | 45.7 |
| Organic Matter | % | 0.1 | MCERTS | - | 18 | - | - | - |
| Organic Matter (automated) | % | 0.1 | MCERTS | 10 | - | 6.8 | 6.8 | 3.6 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.08 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | 0.12 | 0.38 | 0.06 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | 0.12 | 0.25 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | 0.1 | 0.21 | < 0.05 | 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 1.7 | 3.2 | 0.49 | 0.57 | 0.2 |
| Anthracene | mg/kg | 0.05 | MCERTS | 0.45 | 1 | 0.13 | 0.12 | 0.07 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 5.5 | 12 | 2 | 0.95 | 0.62 |
| Pyrene | mg/kg | 0.05 | MCERTS | 5.6 | 13 | 2 | 0.85 | 0.59 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 3.1 | 7.3 | 1.2 | 0.44 | 0.42 |
| Chrysene | mg/kg | 0.05 | MCERTS | 3 | 8.1 | 1.1 | 0.47 | 0.37 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 4.7 | 12 | 1.8 | 0.52 | 0.71 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 1.8 | 5.9 | 0.68 | 0.21 | 0.23 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 4.1 | 12 | 1.4 | 0.38 | 0.51 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 2.1 | 6.1 | 0.77 | 0.23 | 0.29 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | 0.36 | 1.1 | 0.14 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 2.5 | 7.8 | 0.89 | 0.25 | 0.36 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 35.2 | 90 | 12.8 | 5.03 | 4.37 |

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**Analytical Report Number: 25-057348**
**Project / Site name: Oakfield**
**Your Order No: EAS 2025 851 1**

| Lab Sample Number | | | | 725267 | 725269 | 725270 | 725271 | 725272 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | TP1 | TP2 | TP3 | TP4 | TP5 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Water Matrix | | | | N/A | N/A | N/A | N/A | N/A |
| Depth (m) | | | | 0.10-0.40 | 0.10-0.40 | 0.10-0.40 | 0.10-0.40 | 0.10-0.40 |
| Date Sampled | | | | 15/10/2025 | 15/10/2025 | 15/10/2025 | 15/10/2025 | 15/10/2025 |
| Time Taken | | | | 1320 | 1325 | 1330 | 1335 | 1340 |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 11 | 10 | 12 | 24 | 15 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 110 | 93 | 53 | 50 | 110 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.69 | 0.61 | 0.63 | 0.92 | 1.2 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 3.1 | 2 | 2.5 | 2.4 | 1.3 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.6 | 0.3 | < 0.2 | 0.3 | 0.3 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 22 | 19 | 23 | 24 | 33 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 36 | 36 | 21 | 14 | 37 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 130 | 140 | 54 | 32 | 41 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | 11 | 11 | 5.8 | 24 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | 1.4 | < 1.0 | 1.2 | 1.1 | 1.7 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 33 | 29 | 35 | 34 | 43 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 680 | 160 | 80 | 71 | 140 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH Total >EC6 - EC40 $_{EH_CU+HS_1D_TOTAL}$ | mg/kg | 10 | NONE | 120 | 260 | 35 | < 10 | 20 |
| Petroleum Range Organics (EC6 - EC10) $_{HS_1D_TOTAL}$ | mg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH (EC10 - EC40) $_{EH_CU_1D_TOTAL}$ | mg/kg | 10 | MCERTS | 120 | 260 | 35 | < 10 | 20 |

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

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**Analytical Report Number: 25-057348**
**Project / Site name: Oakfield**
**Your Order No: EAS 2025 851 1**

| Lab Sample Number | | | | 725273 |
|---|---|---|---|---|
| Sample Reference | | | | TP6 |
| Sample Number | | | | None Supplied |
| Water Matrix | | | | N/A |
| Depth (m) | | | | 0.10-0.40 |
| Date Sampled | | | | 15/10/2025 |
| Time Taken | | | | 1345 |
| Analytical Parameter (Soil Analysis) | Units | Test Limit of detection | Test Accreditation Status | |
| Stone Content | % | 0.1 | NONE | < 0.1 |
| Moisture Content | % | 0.01 | NONE | 18 |
| Total mass of sample received | kg | 0.1 | NONE | 0.8 |

**Asbestos**

| | | | | |
|---|---|---|---|---|
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected |
| Asbestos Analyst ID | N/A | N/A | N/A | OGR |
| Analysis completed | N/A | N/A | N/A | 31/10/2025 |

**General Inorganics**

| | | | | |
|---|---|---|---|---|
| pH (L099) | pH Units | N/A | MCERTS | 5.9 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1.0 |
| Water Soluble Sulphate as $SO_4$ 16hr extraction (2:1) | mg/kg | 2.5 | MCERTS | 110 |
| Water Soluble $SO_4$ 16hr extraction (2:1) | mg/l | 1.25 | MCERTS | 53 |
| Organic Matter | % | 0.1 | MCERTS | - |
| Organic Matter (automated) | % | 0.1 | MCERTS | 6.1 |

**Speciated PAHs**

| | | | | |
|---|---|---|---|---|
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | 0.13 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | 0.41 |
| Pyrene | mg/kg | 0.05 | MCERTS | 0.4 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | 0.21 |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.23 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.31 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | ISO 17025 | 0.12 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | 0.23 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.12 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.15 |

**Total PAH**

| | | | | |
|---|---|---|---|---|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 2.31 |

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**Analytical Report Number: 25-057348**
**Project / Site name: Oakfield**
**Your Order No: EAS 2025 851 1**

| | | | | |
|---|---|---|---|---|
| **Lab Sample Number** | | | | 725273 |
| **Sample Reference** | | | | TP6 |
| **Sample Number** | | | | None Supplied |
| **Water Matrix** | | | | N/A |
| **Depth (m)** | | | | 0.10-0.40 |
| **Date Sampled** | | | | 15/10/2025 |
| **Time Taken** | | | | 1345 |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Test Limit of detection** | **Test Accreditation Status** | |
| **Heavy Metals / Metalloids** | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 13 |
| Barium (aqua regia extractable) | mg/kg | 1 | MCERTS | 63 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.82 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 1.3 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 26 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 20 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 33 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 13 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 40 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 72 |
| **Petroleum Hydrocarbons** | | | | |
| TPH Total >EC6 - EC40 $_{EH_CU+HS_1D_TOTAL}$ | mg/kg | 10 | NONE | 15 |
| Petroleum Range Organics (EC6 - EC10) $_{HS_1D_TOTAL}$ | mg/kg | 1 | ISO 17025 | < 1.0 |
| TPH (EC10 - EC40) $_{EH_CU_1D_TOTAL}$ | mg/kg | 10 | MCERTS | 15 |

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**Analytical Report Number : 25-057348**
**Project / Site name: Oakfield**

* 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 * |
|---|---|---|---|---|
| 725267 | TP1 | None Supplied | 0.10-0.40 | Brown sand with vegetation and stones |
| 725269 | TP2 | None Supplied | 0.10-0.40 | Brown sand with vegetation and stones |
| 725270 | TP3 | None Supplied | 0.10-0.40 | Brown loam and sand with vegetation |
| 725271 | TP4 | None Supplied | 0.10-0.40 | Brown sand with vegetation and stones |
| 725272 | TP5 | None Supplied | 0.10-0.40 | Brown clay and loam with vegetation |
| 725273 | TP6 | None Supplied | 0.10-0.40 | Brown sand with vegetation |

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**Analytical Report Number : 25-057348**
**Project / Site name: Oakfield**

**Water matrix abbreviations:**
**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI 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 |
| Boron, water soluble, in soil | Determination of water soluble boron in soil by hot water extract followed by ICP-OES | In-house method based on Second Site Properties version 3 | L038B | D | MCERTS |
| Sulphate, water soluble, in soil (16hr extraction) | Sulphate, water soluble, in soil (16hr extraction) | In-house method | L038B | D | MCERTS |
| Speciated 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 |
| Total petroleum hydrocarbons by GC-FID in soil | Determination of total petroleum hydrocarbons in soil by GC-FID | In-house method | L076B | D | MCERTS |
| Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil (Summed Bands) | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS (Summed Bands). | Calculation | L076B/L088-PL | D/W | NONE |
| Total cyanide in soil | Determination of total cyanide by distillation followed by colorimetry | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton | L080-PL | W | MCERTS |
| Total petroleum hydrocarbons by HS-GC-MS in soil | Determination of total petroleum hydrocarbons in soil by HS-GC-MS | In-house method | L129-PL | W | ISO 17025 |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement | In-house method | L099-PL | D | MCERTS |
| Soil Descriptions | Textural classification | In-house method | L019B | W | NONE |

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**Analytical Report Number : 25-057348**
**Project / Site name: Oakfield**

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

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Organic matter 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 | L023B | 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.**

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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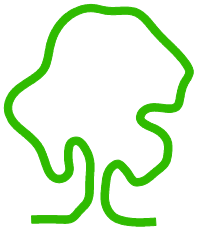

eas ltd
Environmental Assessment Services Ltd
Unit 4B, The Courtyard, Holmsted Farm, Staplefield Road, Cuckfield,
West Sussex, RH17 5JT
Phone : +44 (0) 1444 882552 email : info@easltd.co.uk
web site : www.easltd.co.uk