ASHDOWN
SITE INVESTIGATION

REMEDIATION STRATEGY

15-18 FAIRFIELD COTTAGES
COWFOLD
WEST SUSSEX

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1. INTRODUCTION

It is proposed to demolish the properties 15-18 Fairfield Cottages, Cowfold, West Sussex and to construct 8 no. new residential units at the site with private and communal areas of soft landscaping and associated car parking bays.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q15666, dated 3rd September 2025. The instruction to proceed was received from the client.

Ashdown Site Investigation Ltd. has previously prepared a Combined Geotechnical and Ground Contamination Risk Assessment[1] and a Supplementary Ground Contamination Risk Assessment and Remediation Strategy[2], and a Supplementary Ground Contamination Risk Assessment[3] for the site. This report must be read in conjunction with the previous ground contamination risk assessment reports prepared for the site. This report supersedes the previous remediation strategy[2].

2. SITE LOCATION

The site is located to the south-east of the road Fairfield Cottages, Cowfold, West Sussex and is centred on the approximate Ordnance Survey national grid reference 521456, 122686.

3. REMEDIATION STRATEGY

Current best practice guidance recommends that any remedial action proposed for the site shall be justified. The pollutant linkages identified by the quantitative risk assessment are considered to provide sufficient justification for remedial works.

The remediation works have been developed to meet the technical objectives for the development, the major drivers behind which are:

- To achieve successful remediation within a particular timescale and budget;
- Familiarity with the methodology by the developer/ground worker;
- Confidence that the remediation can be carried out by good technical practices; and
- Likely success of the style of remediation.

This revised remediation strategy has been produced following receipt of comments on the previous ground contamination risk assessment and remediation strategy[2].

3.1 Options Appraisal

The driver for remediation at the site is the presence of topsoil/made ground soils containing concentrations of lead and PAH compounds that are considered to pose an unacceptable level of risk to human health in the context of the development. There are no in situ or ex situ remediation techniques available to reduce the concentrations of lead and PAH compounds within the soils to below that of the published screening values.

[1] Project Ref: P15524, Report Ref: R15194, Issue No. 1, dated 12th April 2022
[2] Project Ref: P17051, Report Ref: R16586, Issue No. 1, dated 30th May 2025
[3] Project Ref: P17051, Report Ref: R16872, Issue No. 1, dated 17th September 2025

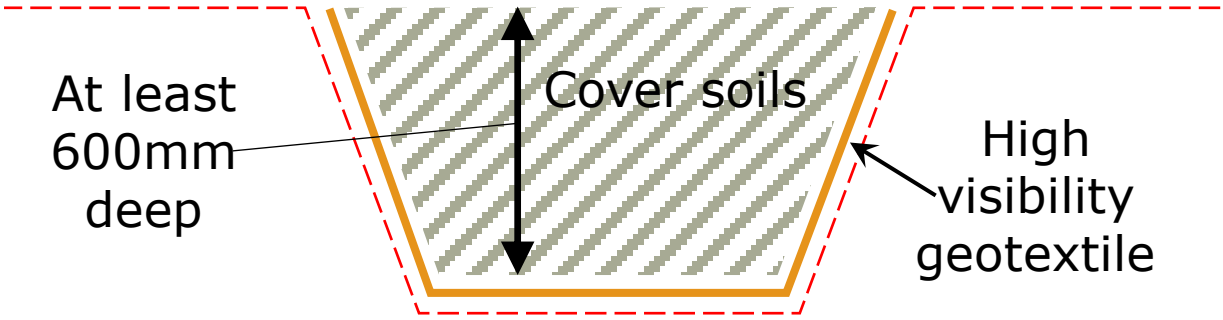
The recommended works must be achievable by the groundworker, using techniques that they are familiar with. It is therefore considered that the remediation proposals could either comprise the complete removal of the contaminant source (the made ground soils), or the provision of a cover system to sever the contaminant pathways in areas where the end users may reasonably be expected to be exposed to the soils or soil derived dust.

Both approaches are considered to be equally straightforward and both would be an effective approach to reducing the risk to end users of the site to an acceptable level.

3.2 Protection of Human Health

Within all proposed areas of garden and/or soft landscaping outside of the RPA, the made ground soils will be removed either to expose the undisturbed soils, or to a sufficient depth to allow the placement of at least 600mm of verified "clean" imported soils. The cover system soils must be underlain by a high visibility geotextile marker which laps up the sides of the excavation to prevent future intermixing between the cover system soils and the residual made ground.

A schematic cross section of the cover system construction is shown below.



The depth of the cover system specified represents "two spade depths" to allow for planting of trees, shrubs etc. without residents coming into contact with the contaminated soils remaining at depth.

Where smaller planting beds are proposed at the front of the properties, it may be difficult to provide the full 600mm of cover due to the presence of concrete haunching or other adjacent fixtures, and likely incoming services. In such limited areas, the made ground will be removed to a sufficient depth to allow the placement of at least 450mm of verified "clean" imported soils.

Should any tree planting be proposed within areas of soft landscaping, then the depth of the cover system (if required) must be locally deepened to that required for the tree pit.

Elsewhere on the site the presence of building cover, driveways and parking areas, patios and permanent access ways comprising hard cover will act to sever the contaminant pathways and thereby reduce the risk to end users to an acceptable level.

The extents of the proposed remedial works are detailed on Figure 1.

3.3 Protection of Controlled Waters

The risk assessment did not identify any unacceptable risks to controlled waters beneath the site and therefore no specific remedial works are considered necessary in this regard.

3.4 Protection of Services

Two samples of the made ground from within the former hardstanding / parking area of the site recorded concentrations of petroleum hydrocarbons above the threshold value for the use of PE water supply pipework.

Given that only a shallow depth of made ground was present in this location, this is unlikely to pose a significant risk to new water supply runs. However, it is strongly recommended that the water supply company be consulted at an early stage to determine whether they require any further investigation or assessment, or whether specific protective measures, such as barrier pipe, are required for new water supply runs.

All other service providers' requirements must be fully adhered to in order to reduce the risk to end users and services to an acceptable level. Details of any measures required by service providers and confirmation of their implementation will be included within the verification report.

3.5 Protection of Construction Workers

All construction workers must undertake their own risk assessment, based upon the works to be carried out and the proposed method by which this will be achieved, in accordance with current health and safety legislation. Their assessment should take into account all available information about the site, including that present within this report.

Appropriate working procedures and PPE should be adopted to ensure the health and safety of the site operatives. Instruction should be given in the recognition of potentially hazardous materials. All site personnel should be appropriately briefed on the discovery strategy, presented below, and what actions they must take in the event that further evidence of contamination is identified or suspected.

3.6 Discovery Strategy

If, during the course of the site clearance and development works, any materials not previously identified by the investigation that are suspected of being 'contaminants' are encountered, then the following procedure will apply:

- All works in that area are to cease and the site manager informed.
- Advice sought from suitably qualified and experienced personnel as to whether any further site inspection, sampling, testing and/or assessment is deemed necessary.
- If required, the conclusions of any assessment and any proposed remedial works (if required) are to be agreed by the local authority.
- If necessary, full details of any remedial works are to be included in the verification report for the site.

Suspected 'contamination' may take the following form, though it is noted that this list is not exhaustive and site operatives should ask if they are at all unsure of any findings:

- Soil or water looks oily and/or has an oily odour
- Soil or water has a solvent type of odour
- Significant quantities of man-made materials within fill such as paint cans, car parts, glass fragments
- Suspected asbestos containing materials (insulating boards, cement, loose fibres etc.)
- Significant volumes of clinker like or ashy material
- Sand bags, and/or subsurface concrete structures
- Animal carcasses or evidence of animal burial pits

4. VERIFICATION PLAN

A checklist summarising the requirements of the verification report is presented within Appendix A.

Depending on the development programme it may be necessary for interim verification reports to be produced for individual plots or groups of plots, prior to the completion of all development works.

4.1 Stripped Formations and Placement of High Visibility Geotextile Marker

For all areas where remediation works are required (reference Figure 1) the formation level will be inspected prior to placement of any cover soils to confirm either the removal of all made ground soils, or that the excavations are sufficiently deep to enable placement of the required thickness of cover soils and to document the placement of the high visibility geotextile marker.

A photographic record of all stripped formations will be maintained for inclusion in the verification report.

If for any reason the above inspections are not undertaken for areas where remediation works are required, retrospective verification will be carried out by way of the excavation of trial pits to expose the geotextile in representative locations. In such circumstances these works may be undertaken in conjunction with the works detailed in Section 4.2.

4.2 Cover System Depth

Within any gardens where the cover system is necessary due to locally deeper made ground, the depth of cover soils placed will be confirmed by the excavation of a trial hole within that garden, and measurement of the depth of cover using a tape.

Photographic evidence of the depth of cover soils within each trial excavation will be included in the verification report. Photographs will also show the presence of the geotextile layer at the base of the trial excavation.

For any gardens where all made ground soils have been removed to expose the formation level, the depth of cover soils will not be measured. However, any topsoil placed as a growing medium will still be subject to testing, as discussed below.

4.3 Tree Pits

Where the made ground has not been removed from soft landscaped areas, the contractor shall provide photographic evidence of the construction of the tree pits, demonstrating that the high visibility geotextile marker extends to the base of the tree pit and backfilling with appropriate cover soils.

4.4 Services

The contractor will provide evidence that the water supply pipe material used is acceptable to the local water supply company. Confirmation of any other service providers' requirements and evidence to demonstrate adherence to them are to be included in the verification report.

4.5 Imported Materials

No imported materials will be sourced from potentially contaminated (e.g. industrial) sites. It is recommended that chemical testing results are obtained and supplied for comment prior to accepting the soils on site. Obtaining such results does not negate the need to carry out sampling and testing of the soils, once brought onto the site.

Once imported materials have been brought to site they should ideally be stockpiled and protected from cross contamination with any other materials already on site prior to inspection, sampling and testing by Ashdown Site Investigation Ltd. However, if this is not practical, soils may be placed directly into garden areas and then inspected, sampled and tested.

The table below summarises the soil screening values[4] against which any imported soils will be assessed.

Table 1. Calculated soil screening values for imported soils

Contaminant	Screening Value (mg/kg)	Contaminant	Screening Value (mg/kg)
Arsenic	37	**Fluorene**	170
Cadmium	11	**Phenanthrene**	95
Chromium	910	**Anthracene**	2400
Copper	2400	**Fluoranthene**	280
Lead	200	**Pyrene**	620
Mercury	40	**Benz(a)anthracene**	7.2
Nickel	180	**Chrysene**	15
Selenium	250	**Benzo(b)fluoranthene**	2.6
Zinc	3700	**Benzo(k)fluoranthene**	77
Hexavalent Chromium	6	**Benzo(a)pyrene**	2.2
Water Soluble Boron	290	**Indeno(123-cd)pyrene**	27
Naphthalene	2.3	**Dibenz(ah)anthracene**	0.24
Acenaphthylene	170	**Benzo(ghi)perylene**	320
Acenaphthene	210	**Asbestos**	None detected

It is noted that the SSV are only protective of long-term risk to human health and do not necessarily represent suitable concentrations for planting or landscaping. If necessary, a horticulturalist should be consulted in this regard.

[4] Comprising 'Suitable For Use Levels' (S4ULs), 'The LQM/CIEH Suitable 4 Use Levels, 2015' and for lead, the Category 4 Screening Level (C4SL), SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report, published by DEFRA, 2014.

All soils must be free from any visual or olfactory evidence of suspected petroleum hydrocarbon contamination and must not contain any significant quantity of putrescible material (incl. wood or paper). Along with testing for the contaminants listed above, testing will also be undertaken to confirm the absence of any significant concentrations of petroleum hydrocarbons.

All soils used as surface dressing or as part of the cover system must be free from propagules of aggressive weeds, fragments of glass, bricks, concrete, wire or other potentially hazardous foreign matter and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems (introduced in the soil) or traumatic injury.

In the event that any individual sample of imported material records concentrations of contaminants above the screening values listed above, the following method of assessment will be undertaken:

- Statistical analysis of the results, along with an assessment of whether any statistical 'outliers' should be removed from the dataset and treated as 'hotspots'. If the data indicates that the majority of the soil mass as a whole may be considered to contain contaminant concentrations below the screening values then it may be deemed suitable to remain.
- Depending on the findings of the analysis additional testing (which may include retests of the original sample) may be undertaken along with further analysis of the results to determine if this is representative of a widespread issue, or may be attributed to a smaller part of the site, or batch of imported soils.
- Liaison with the regulators may be undertaken to agree whether or not the materials are to be considered suitable to remain.

Where testing and analysis identify a significant failure and the procedures above do not provide sufficient evidence that the imported materials are suitable to remain, then the imported soils will be removed and replaced with other suitable soils.

4.5.1 Sampling Rates for Imported Soils

To ensure compliance with the local authority's request, all imported soils will be subject to verification testing at a rate of 1 sample per 50m^3, with a minimum of three samples tested per batch of soils.

A batch in this instance is considered to refer to soils provided from a single supplier, and brought to site on the same day, or on consecutive days e.g. if 16 loads were delivered to site across a Monday, Tuesday and Wednesday, they would be considered as one batch, but if 3 loads were delivered on a Monday, and 5 loads 10 days later, these would be considered separate batches, even if the same supplier was used.

5. POST REMEDIATION RISK ASSESSMENT

The remedial works set out in this report are considered to remove or sever the identified pollutant linkages. A post remediation conceptual model is presented in the following table.

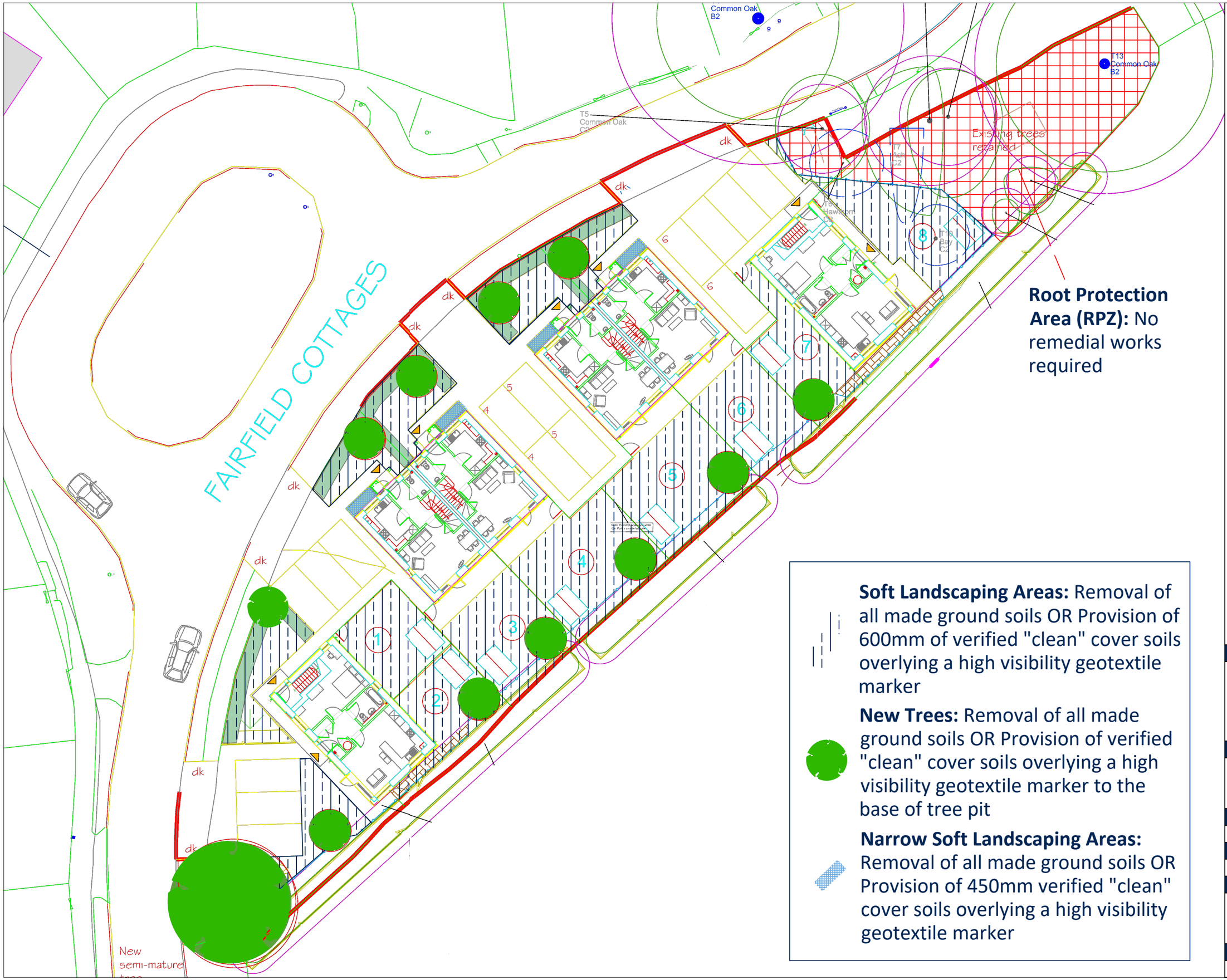
Table 2. Post Remediation Conceptual Model for End Users – Potential Pollutant Linkages and Assessment of Risk

Contaminant Source	Remedial Measures	Potential Pathway(s)	Assessment of Risk to Human Health
Made ground and topsoil across the site (excluding RPA) containing elevated levels of heavy metals and PAH Compounds.	**Soft Landscaping Areas:** Removal of all made ground soils OR Provision of 600mm of verified 'clean' cover soils over a high visibility geotextile marker	N/A - Source Removal OR Pathways severed by remedial measures	No significant pollutant linkages identified.
	New Trees Removal of all made ground soils OR Provision of verified 'clean' cover soils over a high visibility geotextile marker to the base of the tree pit	N/A - Source Removal OR Pathways severed by remedial measures	
	Narrow Soft Landscaping Areas Removal of all made ground soils OR Provision of 450mm of verified 'clean' cover soils over a high visibility geotextile marker	N/A - Source Removal OR Pathways severed by remedial measures	
	Provision of building cover, driveways and parking areas, patios and permanent access ways comprising hard cover	Pathways severed by construction works	

In addition, the water supply pipe used at the development should be agreed by the local water supply company.

FIGURES

Figure 1 Remedial Works Plan



Root Protection Area (RPZ): No remedial works required

Soft Landscaping Areas: Removal of all made ground soils OR Provision of 600mm of verified "clean" cover soils overlying a high visibility geotextile marker

New Trees: Removal of all made ground soils OR Provision of verified "clean" cover soils overlying a high visibility geotextile marker to the base of tree pit

Narrow Soft Landscaping Areas: Removal of all made ground soils OR Provision of 450mm verified "clean" cover soils overlying a high visibility geotextile marker

ASHDOWN SITE INVESTIGATION

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Site

15 - 18 Fairfield Cottages
Cowfold
West Sussex

Project Ref.

C17051

Figure No.

1

Drawing Title

Remedial Works Plan

Scale

Not to Scale

APPENDIX A

Checklist for Verification Report(s)

Item	Tick (✓)
Documentation (Including Photographs) of Stripped Formation	
Documentation (Including Photographs) of Placed Geotextile and Geogrid	
Documentation (Including Photographs) Confirming Depth of Cover Soils	
Laboratory Test Data for Imported Materials	