Wesson Environmental

Contaminated Land Solutions
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Remediation Method Statement

1 Background

An intrusive investigation was carried out by Wesson Environmental Ltd in January 2021. Lead and PAH compounds exceeded GAC in shallow soils some locations and therefore, to mitigate risks to future site users from this source, it was appropriate to carry out remediation to provide protection to this receptor. No vapour phase pathways were considered to be present, and therefore source removal with soils replaced with certified clean material was considered to be a feasible option to bring about remediation. As an alternative, the emplacement of a cover system was considered to be a suitable option.

2 Remedial measures

2.1 Shallow soils

The current data indicates that contamination of site soils is by contaminants that are unlikely to form a vapour phase. Therefore, the risks to future site users will occur where there is potential for contact with site soils or dust generation. Consequently, we propose that an excavation and cover system is put in place in areas of soft landscaping as follows:

1. Soils must be excavated to a depth that will allow the cover system to be placed as described below. The excavation should be supervised to ensure removal of contaminated soils.
2. The base and side of the excavated areas should be sampled and tested to ensure that contaminants described above are no longer present.
3. The cover system will comprise a minimum of 600mm depth comprising:
    a. 150mm of topsoil
    b. 450mm of subsoil the bottom 150mm of which will comprise a hard dig layer.
    c. Alternatively, fill comprising of topsoil only is acceptable if the bottom 150mm is made up of a hard dig layer.

4. All imported subsoils and topsoils should be suitable for proposed use of the site for residential housing. It is recommended that in the case of topsoils that these comply with BS3882:2015. Validation of soils must take place after placement on site (see 3.1). Concentrations of potential contaminants present must be below the guideline values in Appendix 1. The laboratory analysis must also include a screen for asbestos.
5. The capping layer should be underlain by a hard dig layer. The hard dig layer should consist of 150mm of granular material.
6. The base of the excavation should be compacted prior to placement of capping.

Alternatively, instead of excavation, a cover system may be put in place. The cover system should conform to points 3-6 above.

3 Validation

3.1 Soils

1. The depth of excavation in the garden areas should be visually validated and photographic evidence produced to show adequate removal of soils has taken place. This should include photographs taken during the excavation.
2. If no excavation is to take place, but a cover system is to be put in place, then a photographic record should be kept during emplacement showing the depth of each layer emplaced. This should use a measuring staff or tape to clearly show emplaced depths.
3. Representative samples of the capping soils shall be collected at a rate of 1 sample per plot following emplacement. If separate topsoil and sub soil is placed, then sampling should be at the rate of 1 sample per plot per layer i.e. 1 sample of topsoil per plot and 1 sample of subsoil per plot. Each sample shall be forwarded to a UKAS and MCERTS accredited laboratory for analysis of the determinands in Appendix 1 plus asbestos screen. Concentrations must be below the concentrations detailed in tables Appendix 1.
4. Waste transfer notes must be obtained for all materials going off site and should be included in the validation report.
5. A validation report shall be produced and submitted to the LPA including details of the above.

4 Discovery strategy

Care should be taken during excavation or working of the site to investigate any soils, which appear by eye or odour to be contaminated or of different character to those analysed. In the event of any discovery of potentially contaminated soils or materials, it should be quarantined and reported to the most senior member of site staff for action. The location, type and quantity must be recorded, and the Local Authority Contaminated Land Officer notified immediately, and approval must be sought prior to implementing any proposed mitigation action.

The discovery strategy must remain on site at all times and must demonstrate a clear allocation of responsibility for reporting and dealing with contamination. A copy of the strategy must be placed on the health & safety notice board and /or displayed in a prominent area where all site staff are able to take note of and consult the document at any time. Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the discovery strategy.

Dr. Richard Wesson

[redacted]

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Appendix 1

List of determinands and relevant guideline values

Table 1. Contaminant thresholds.

Inorganics		
RESIDENTIAL WITH PLANT UPTAKE		
Determinand	GAC	Source
Arsenic	37	LQM/CIEH S4UL
Barium	1300	CLEA
Beryllium	1.7	LQM/CIEH S4UL
Boron (water-soluble)	290	LQM/CIEH S4UL
Cadmium	11	LQM/CIEH S4UL
Chromium	910	LQM/CIEH S4UL
Copper	2400	LQM/CIEH S4UL
Lead	210	C4SL
Mercury	40	LQM/CIEH S4UL
Nickel	180	LQM/CIEH S4UL
Selenium	250	LQM/CIEH S4UL
Vanadium	410	LQM/CIEH S4UL
Zinc	3700	LQM/CIEH S4UL
Asbestos	None	

PAH Compounds				
RESIDENTIAL WITH PLANT UPTAKE				
Determinand	1% SOM	2.5% SOM	6% SOM	Source
Acenaphthene	210	510	1100	LQM/CIEH S4UL
Acenaphthylene	170	420	920	LQM/CIEH S4UL
Anthracene	2400	5400	11000	LQM/CIEH S4UL
Benzo(a)Anthracene	7.2	11	13	LQM/CIEH S4UL
Benzo(a)Pyrene	2.2	2.7	3	LQM/CIEH S4UL
Benzo(b/k)fluoranthene	2.6	3.3	3.7	LQM/CIEH S4UL
Benzo(ghi)Perylene	320	340	350	LQM/CIEH S4UL
Benzo(k)fluoranthene	77	93	100	LQM/CIEH S4UL
Chrysene	15	22	27	LQM/CIEH S4UL
Dibenzo(ah)Anthracene	0.24	0.28	0.3	LQM/CIEH S4UL
Fluoranthene	280	560	890	LQM/CIEH S4UL
Fluorene	170	400	860	LQM/CIEH S4UL
Indeno(123-cd)Pyrene	27	36	41	LQM/CIEH S4UL
Naphthalene	2.3	5.6	13	LQM/CIEH S4UL
Phenanthrene	95	220	440	LQM/CIEH S4UL
Pyrene	620	1200	2000	LQM/CIEH S4UL

TPH Compounds				
RESIDENTIAL WITH PLANT UPTAKE				
Determinand	1% SOM	2.5% SOM	6% SOM	Source
TPH (C5-C6 aliphatic)	42	78	160	LQM/CIEH S4UL
TPH (C6-C8 aliphatic)	100	230	530	LQM/CIEH S4UL
TPH (C8-C10 aliphatic)	27	65	150	LQM/CIEH S4UL
TPH (C10-C12 aliphatic)	130	330	760	LQM/CIEH S4UL
TPH (C12-C16 aliphatic)	1100	2400	4300	LQM/CIEH S4UL
TPH (C16-C21 aliphatic)	65000	92000	110000	LQM/CIEH S4UL
TPH (C21-C35 aliphatic)	65000	92000	110000	LQM/CIEH S4UL
TPH (C6-C7 aromatic)	70	140	300	LQM/CIEH S4UL
TPH (C7-C8 aromatic)	130	290	660	LQM/CIEH S4UL
TPH (C8-C10 aromatic)	34	83	190	LQM/CIEH S4UL
TPH (C10-C12 aromatic)	74	180	380	LQM/CIEH S4UL
TPH (C12-C16 aromatic)	140	330	660	LQM/CIEH S4UL
TPH (C16-C21 aromatic)	260	540	930	LQM/CIEH S4UL
TPH (C21-C35 aromatic)	1100	1500	1700	LQM/CIEH S4UL

BTEX Compounds				
RESIDENTIAL WITH PLANT UPTAKE				
Determinand	1% SOM	2.5% SOM	6% SOM	Source
Benzene	0.087	0.17	0.37	LQM/CIEH S4UL
EthylBenzene	47	110	260	LQM/CIEH S4UL
M/P Xylene	56	130	310	LQM/CIEH S4UL
O Xylene	60	140	330	LQM/CIEH S4UL
Toluene	130	290	660	LQM/CIEH S4UL