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5th March 2015

Riversee Limited
Orchard House
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Newport
NP26 3BS

For the attention of Mr Darran Watts

Dear Darran

CHEMICAL TESTING: STOCKPILED MATERIAL INTENDED AS ENGINEERED FILL

1.0 Introduction

Riversee Limited is proposing to undertake earthworks on a proposed development site off Herbert Road, Newport, where the site is to be raised by up to 1.6m, taking it to a level of 8.8m AOD.

Riversee Limited currently has a large stockpile and adjacent smaller stockpile of material intended for use as engineered fill. The stockpiles are understood to total 22,000m³ in volume.

Terra Firma (Wales) Limited was commissioned by Riversee Limited to undertake sampling and chemical testing of this material to assess its suitability for use.

This has been carried out in accordance with Terra Firma (Wales) Limited's Remediation Strategy prepared for the site, which specifies that for each 250m³ (per source) that 1 representative sample be taken for screening. This strategy was agreed with Newport City Council. The stockpile is made up of several indistinguishable sources, and has therefore been treated as a singular source.

A series of 13 trial holes were excavated into the top of the main stockpile to a depth of 3m. Samples were taken at varying depths. The remainder (bottom) of the main stockpile, and the smaller stockpile, will be sampled and tested in due course, once the 3m cover has been removed.

The trial pits/soils were logged and a total of 36 samples were taken (equating to an estimated 9000m³ of soil).

2.0 Soil Test Results

The soils were submitted to the laboratories of Derwentside Environmental Testing Services for testing. All results are summarised in the following tables, and have been compared to regulatory residential soil guidelines.

Chemical test certificates can be enclosed.

Table 2.1 Summary of Soil Chemical Test Results Standard Suite					
Substance	Threshold (mg/kg)	Source	Measured Concentrations of Tested Substances (mg/kg)		Number of Exceedences
			Minimum	Maximum	
Arsenic	32	CLEA	<0.2	19	0
Cadmium	10	CLEA	<0.1	2.1	0
Chromium III	627	CIEH	<0.15	53	0
Chromium VI	4.3	CIEH	<1.0	<1.0	0
Copper	2330	CIEH	<0.2	140	0
Lead	276	ATRISK	<0.3	130	0
Mercury	170	CLEA	<0.05	0.27	0
Nickel	130	CLEA	<1.0	53	0
Selenium	350	CLEA	<0.5	43	0
Zinc	3750	CIEH	<1.0	1200	0
Cyanide	8	CLEA	<0.1	0.2	0
Organic matter	-	-	0.7	9.7	-
Sulphate	2400	BRE	600	2700	-
pH	-	-	8.0	11.5	-
Phenol	420	CLEA	<0.3	2.2	0
Total PAH	-	CLEA	<0.1	4.3	*

Notes:

- * See speciated PAH results (see Table 2.2)

2.0 Soil Test Results (Continued)

Table 2.2 Summary of Soil Test Results Speciated PAH					
Substance	Threshold (mg/kg)	Source	Measured Concentrations of Tested Substances (mg/kg)		Number of Exceedences
			Minimum	Maximum	
Naphthalene	1.5	CIEH	<0.03	<0.03	0
Acenaphthylene	170	CIEH	<0.03	<0.03	0
Acenaphthene	210	CIEH	<0.03	<0.03	0
Fluorene	160	CIEH	<0.03	0.04	0
Phenanthrene	92	CIEH	<0.03	0.5	0
Anthracene	2300	CIEH	<0.03	0.1	0
Fluoranthene	260	CIEH	<0.03	1.2	0
Pyrene	560	CIEH	<0.03	0.86	0
Benzo(a)anthracene	3.1	CIEH	<0.03	0.38	0
Chrysene	6.0	CIEH	<0.03	0.41	0
Benzo(b)fluoranthene	5.6	CIEH	<0.03	0.31	0
Benzo(k)fluoranthene	8.5	CIEH	<0.03	0.13	0
Benzo(a)pyrene	0.83	CIEH	<0.03	0.22	0
Benzo(ghi)perylene	44	CIEH	<0.03	0.11	0
Dibenzo(ah)anthracene	0.76	CIEH	<0.03	<0.03	0
Indeno(123cd)pyrene	3.2	CIEH	<0.03	0.1	0

Notes:

- GAC based on 1% soil organic matter content (SOM)

2.0 Soil Test Results (Continued)

Table 2.3 Summary of Soil Chemical Test Results Petroleum Hydrocarbons					
Substance	Threshold (mg/kg)	Source	Measured Concentrations of Tested Substances (mg/kg)		Number of exceedences
			Minimum	Maximum	
<u>PH- Aliphatic</u>					
>C5-C6	30	CIEH	<0.01	<0.01	0
>C6-C8	73	CIEH	<0.01	<0.01	0
>C8-C10	19	CIEH	<0.01	<0.01	0
>C10-C12	93	CIEH	<1.5	<1.5	0
>C12-C16	740	CIEH	<1.2	7.1	0
>C16-C21^	45000	CIEH	<1.5	15	0
>C21-C35^	45000	CIEH	<3.4	150	0
<u>PH- Aromatic</u>					
>C5-C7	0.33*	CLEA	<0.01	<0.01	0
>C7-C8	610**	CLEA	<0.01	0.01	0
>C8-C10	27	CIEH	<0.01	0.12	0
>C10-C12	69	CIEH	<0.9	<0.9	0
>C12-C16	140	CIEH	<0.5	<0.5	0
>C16-C21	250	CIEH	<0.6	14	0
>C21-C35	890	CIEH	<1.4	260	0

Notes:

- GAC based on 1% soil organic matter content (SOM)

2.0 Soil Test Results (Continued)

All samples were screened for asbestos. The results are as follows:

Table 5.4 Summary of Soil Chemical Test Results Asbestos			
Sample Location	Asbestos Type	Form	Total Mass in Soil (%)
S1	NAD	-	-
S2	NAD	-	-
S3	NAD	-	-
S4	NAD	-	-
S5	NAD	-	-
S6	Chrysotile	Clumps of fibres	0.001
S7	Chrysotile	Bundle of fibres	<0.001
S8	NAD	-	-
S9	NAD	-	-
S10	NAD	-	-
S11	Chrysotile	Bundles of fibres	<0.001
S12	Amosite	Free fibres	<0.001
S13	Amosite Chrysotile	Clumps of fibres	0.024
S14	Chrysotile	Clumps of fibres	<0.001
S15	Chrysotile	Clumps of fibres	<0.001
S16	Chrysotile	Bundles of fibres	<0.001
S16	Chrysotile	Cement fragment	<0.001
S17	Chrysotile	Clumps of fibres	<0.001
S18	Chrysotile	Clumps of fibres	<0.001
S19	Chrysotile	Free fibres	<0.001
S20	Chrysotile	Bundles of fibres	<0.001
S21	Chrysotile	Bundles of fibres	<0.001
S22	Chrysotile	Bundles of fibres	<0.001
S23	Chrysotile	Free fibres	<0.001
S24	NAD	-	-
S25	Chrysotile	Bundles of fibres	<0.001
S26	NAD	-	-
S27	NAD	-	-
S28	NAD	-	-
S29	NAD	-	-
S30	NAD	-	-
S31	NAD	-	-
S32	Chrysotile	Bundles of fibres	<0.001
S33	NAD	-	-
S34	NAD	-	-
S35	NAD	-	-
S36	NAD	-	-

Notes:

- NAD – No Asbestos Detected

Leachate testing of these soils has not yet been performed. If permission is granted to use the materials as fill at Herbert Road then all 36 samples will undergo 2:1 soil leachate analysis in accordance with BS:EN:12457 for the standard suite, speciated PAH and petroleum hydrocarbons to ensure that the soils do not present a risk to groundwater.

Results would be compared to appropriate Water Framework Directive thresholds and Drinking Water Directive thresholds (where WFD guidelines are unavailable), and reported to Newport City Council and the NRW for approval prior to use of the soils.

We trust that the above is to your satisfaction, however, if you have any queries or require any further information please do not hesitate to contact us.

Yours sincerely
for: Terra Firma (Wales) Ltd

A handwritten signature in black ink, appearing to read "R Howells".

Mrs Ruth Howells