

From: Rhys Mander
To: ["Lee, Michelle"](#)
Cc: [Poland, Michael](#)
Subject: RE: Coed Darcy-Temporary Collection Chamber (Monitor Phase 20)
Date: 12 June 2012 15:18:00

Michelle

Ok, lets see what the validation results look like, but I agree if the residential units are first floor flats then the commercial thresholds are more appropriate. Thanks for clarifying.

Regards

Rhys Mander MEng CEng MCIHT
Senior Engineer
URS Infrastructure & Environment UK Limited

1 Drake Walk, Brigantine Place, Cardiff, CF10 4AN, United Kingdom

Direct: +44 (0)2920 662 374
Fax: +44 (0)2920 465 961
Mobile: +44 (0)7881 813 744
rhys.mander@urs.com
www.ursglobal.com

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Registered Number: 880328
Registered Office: Scott House, Alencon Link, Basingstoke, Hampshire, RG21 7PP, United Kingdom

From: Lee, Michelle [<mailto:Michelle.Lee@atkinsglobal.com>]
Sent: 12 June 2012 15:10
To: Rhys Mander
Cc: Poland, Michael
Subject: RE: Coed Darcy-Temporary Collection Chamber (Monitor Phase 20)

Rhys

The report does clarify that the residential element is anticipated to relate to apartments overlying the commercial properties. Due to the absence of any gardens or other external space and as the ground floor will remain as commercial properties we felt that these were more applicable in the longer term.

In reality much of this area has been disturbed and much of the existing material removed as part of the ongoing clearance due to the number of structures that have been encountered. We can reassess once we have the results of the validation testing and discuss further with you our proposals for the adopted thresholds.

Kind Regards

Chelle

From: Rhys Mander [<mailto:Rhys.Mander@urs.com>]
Sent: 12 June 2012 14:51
To: Lee, Michelle
Cc: Poland, Michael
Subject: RE: Coed Darcy-Temporary Collection Chamber (Monitor Phase 20)

Michelle

I have reviewed the Temporary Collection Chamber report and my only comment is that the report states 'in the longer term it is believed that this area will comprise commercial/residential end use', whereas commercial thresholds are being used. If a commercial/residential end use is likely then the residential thresholds should be adopted. Please be aware that this will affect your sampling frequencies.

Regards

Rhys Mander MEng CEng MCIHT
Senior Engineer
URS Infrastructure & Environment UK Limited

1 Drake Walk, Brigantine Place, Cardiff, CF10 4AN, United Kingdom

Direct: +44 (0)2920 662 374
Fax: +44 (0)2920 465 961
Mobile: +44 (0)7881 813 744
rhys.mander@urs.com
www.ursglobal.com

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Registered Number: 880328
Registered Office: Scott House, Alencon Link, Basingstoke, Hampshire, RG21 7PP, United Kingdom

From: Lee, Michelle [mailto:Michelle.Lee@atkinsglobal.com]
Sent: 11 May 2012 10:31
To: Rhys Mander
Subject: Coed Darcy-Temporary Collection Chamber (Monitor Phase 20)

Rhys

As discussed, please find attached a copy of our geoenvironmental report for Phase 20. This area relates to a proposed temporary collection tank for the collection of foul water from the first 20 properties within Persimmon Phase 1A. The remediation works proposed are in line with the proposed end use of this area as a commercial/residential area as shown on the Masterplan.

The report recommends clearance of existing structures and further investigation around an area of identified free product. This will be carried out in the next few weeks and will be followed by a validation report confirming the compliance with this area with the requirements of the S106.

Please call if there are any queries

Kind Regards

chelle

Michelle Lee
Senior Geo-Environmental Engineer, Water and Environment

ATKINS
The official engineering design services provider
for the London 2012 Olympic and Paralympic Games

Tel: +44 1952 213280
Mob: +44 7803 261128

Email: michelle.lee@atkinsglobal.com | Web: www.atkinsglobal.com

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From: Rhys Mander
To: ["Lee, Michelle"](#)
Cc: [Poland, Michael](#)
Subject: Coed Darcy Monitor RFI107 - RE: Coed Darcy_Monitor Phase 20
Date: 18 October 2012 13:53:00

Michelle

I have reviewed the validation report for the Temporary Collection Chamber (Monitor Phase 20) and I have the following comments:

- As the proposed development layout is not yet known, please could you confirm how the FFLs have been determined. Is the depth of the remediation excavation considered conservative?
- Please could you provide an isopachyte drawing to compare the depth of the remediation excavation to the FFLs. Please could the isopachyte be banded in 0.5m intervals.
- Presumably the collection chamber will be quite large, and hence quite a deep excavation will be required for the chamber. Presumably this excavation would extend beyond the depth of the remediation excavation and into bedrock. Do you envisage any contamination associated problems with this?
- Section 2.1 of the report makes reference to a substation. Were any targeted investigations undertaken here to check for PCBs?
- The report makes several references to FTS4 but doesn't explain its significance. Presumably it was the most heavily impacted area, but it is outside the phase boundary. What is its significance?
- The report also discusses free product removal from WSMW077. Was this the only borehole where product was encountered?
- The report states that the extent of the remedial works was restricted. Was the whole of the phase remediated?
- With regards the breakout of bedrock, the report discusses the other persimmon phases but it is not clear whether or not rock was broken out within this phase and if so what was observed.
- Please could further details be provided on Stockpile 43. What was the material and where had it come from? The report states that chemical analysis of the material is included in Appendix D. Please could you summarise the analysis undertaken. i.e. what sampling frequency was used and were there any exceedances?
- The report does not appear to include a v/o assessment.
- The report states that heavily stained materials were removed for treatment elsewhere. What volume of material was removed?
- Please could you confirm the surface area of the plot (to confirm that 11 samples does equate to a 20m x 20m grid). Also, the grid shown on drawing 1250 shows a lack of samples in the north eastern corner. Please discuss.
- Please confirm the depth at which the 11 validation samples were collected.
- Were the sides of the excavation validated as per the frequencies in Table 5.1?
- Were any service lines removed? If so, were they validated as per the frequencies in Table 5.1 (the report mentions historic drainage runs)?
- Was any asbestos screening done?

Regards

Rhys Mander MEng CEng MCIHT
Senior Engineer
URS Infrastructure & Environment UK Limited

1 Drake Walk, Brigantine Place, Cardiff, CF10 4AN, United Kingdom

Direct: +44 (0)2920 662 374
Fax: +44 (0)2920 465 961
Mobile: +44 (0)7881 813 744
rhys.mander@urs.com

www.ursglobal.com

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Registered Number: 880328
Registered Office: Scott House, Alencon Link, Basingstoke, Hampshire, RG21 7PP, United Kingdom

From: Lee, Michelle [mailto:Michelle.Lee@atkinglobal.com]
Sent: 15 October 2012 10:38
To: Rhys Mander
Subject: Coed Darcy_Monitor Phase 20

Morning Rhys

Matt is trial pitting on the final section of the Persimmon plot today/tomorrow. Hopefully P2 results should start coming through today.

In the meantime – Ive finally found five minutes to send this to you!

Please let me know if you havent received the SMD letter relating to this area and I can send relevant drawings through to Neil.

Regards

Chelle

Michelle Lee

Senior Geo-Environmental Engineer, Water and Environment

ATKINS

The official engineering design services provider
for the London 2012 Olympic and Paralympic Games

Tel: +44 1952 213280

Mob: +44 7803 261128

Email: michelle.lee@atkinglobal.com | Web: www.atkinglobal.com

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From: Rhys Mander
To: [Poland, Michael](#)
Cc: [Michelle Michelle Lee](#); ["Timmins, Matthew"](#)
Subject: Coed Darcy Monitor - RFI 116 Phase 20 Asbestos Sampling
Date: 20 June 2013 18:47:00

Mike

We have been reviewing Phases 20 (the Temporary Collection Chamber) and 22 (the Cordon Sanitaire) and the certificates have been drafted. I can confirm we are generally satisfied with Phase 22, however we have a query with regards asbestos in Phase 20.

Appendix D of the Geo-environmental Assessment Report (reference 5041216-REM-RPT-783) indicates that seven samples were screened for ACM with no ACM detected (although laboratory certificates for those samples were not attached). Three of these seven samples were taken from within Phase 20.

From the Validation Report (reference 5041216-REM-RPT819), of the 11 soil validation samples collected only two were screened for ACM. White asbestos is reported to have been detected in one of the two samples. These results are not tabulated or discussed in the report but are included in the laboratory certificates appended to the report.

In summary five samples were screened for asbestos and one sample indicated the presence of asbestos.

No quantification analysis has been provided.

We are concerned that ACM screening has not been undertaken at the frequency required by the Section 106 for this phase, and where detected the ACM has not been quantified, therefore no comparison can be made to the RBSL.

Please could you either give further justification for the lack of asbestos data, or otherwise arrange for further samples to be screened and if necessary sent for quantified analysis.

Regards

Rhys Mander MEng CEng MCIHT
Senior Engineer
URS Infrastructure & Environment UK Limited

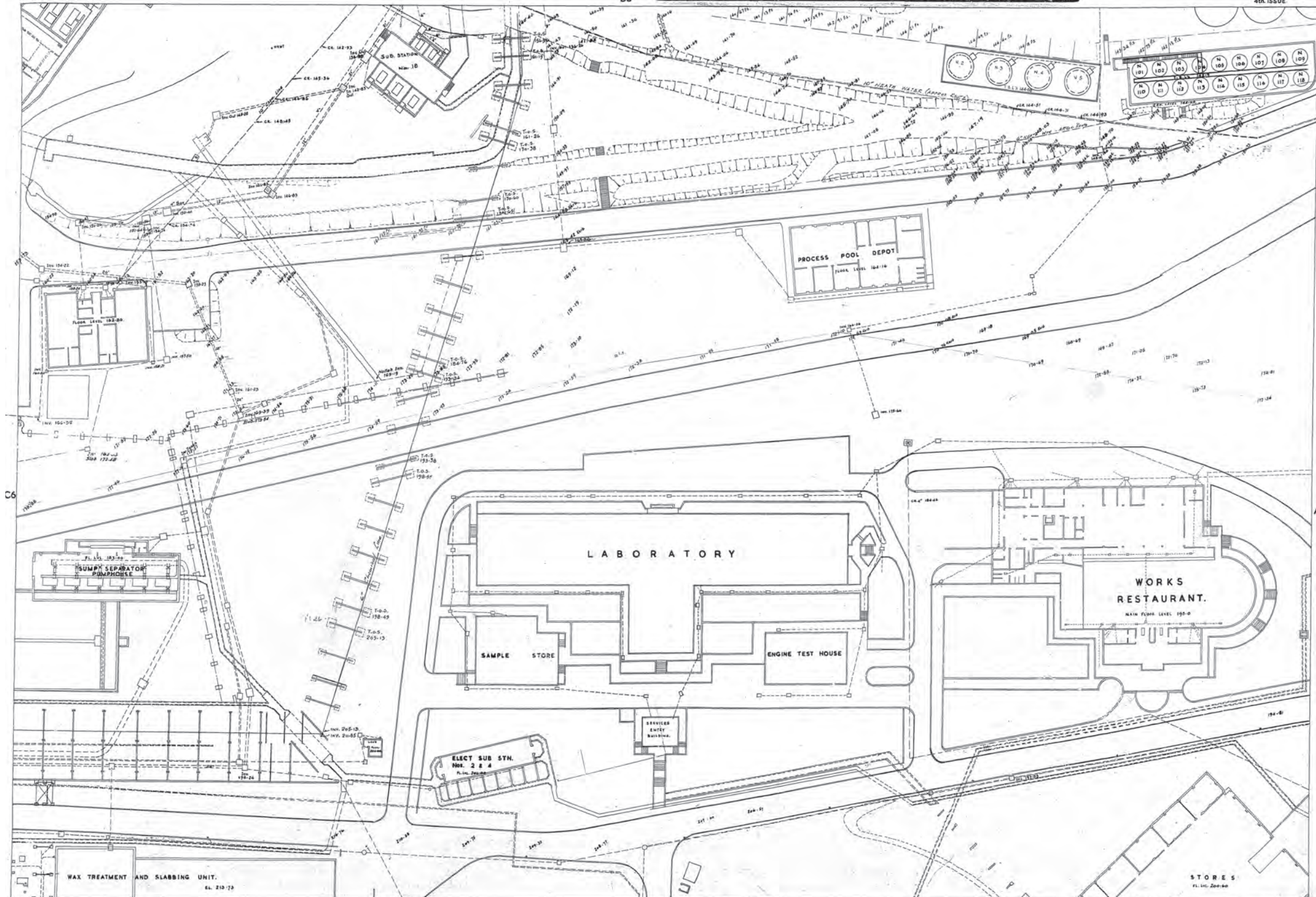
1 Drake Walk, Brigantine Place, Cardiff, CF10 4AN, United Kingdom

Direct: +44 (0)2920 662 374
Fax: +44 (0)2920 465 961
Mobile: +44 (0)7881 813 744
rhys.mander@urs.com
www.ursglobal.com

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Registered Number: 880328
Registered Office: Scott House, Alencon Link, Basingstoke, Hampshire, RG21 7PP, United Kingdom

A E I E HISTORICAL REFERENCE LASER TRACTS



A E I F CO ARISO OF RBSLs A RTCs

Contaminant	RTC (mg/l)
TPH aliphatic C10-C12	>sat
TPH aliphatic C12-C16	>sat
1,2-Dichloroethane	4.80E+00
1,1,1-Trichloroethane	>sat
Tetrachloroethene	>sat
Trichloroethene	2.85E+01
Vinyl chloride	3.38E-01
Dichloromethane	1.98E+03
Cis-1,2 Dichloroethene	7.40E+01
Trans-1,2 Dichloroethene	8.91E+01
1. Where the lower of the vapour or aqueous saturation limits has been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented 2. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation 3. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins 4. The potential presence of free product should be assessed in accordance with information in the S106 (Ref. 1).	

4. Comparison of RBSLs and RTC

As an objective of these works was to establish whether the RBSLs were health protective, the commercial RBSLs and RTC have been compared. This comparison is presented in the tables in this section of the report. As per the approach adopted for the residential and recreational RTC, within the tables within this section, the lower of the RBSL/RTC has been bolded. Therefore where the RBSL has been bolded, it is protective in comparison to the RTC:

- If the RBSL and the RTC are equal, the RBSL is bolded.
- If the RTC is lower than the RBSL, the RTC is bolded⁹.
- If the RBSL is lower than the RTC, the RBSL is bolded.

Where the RTC are greater than the RBSL or the RTC are equal to the RBSL, the values have been marked as final to illustrate that the RBSL is protective. Where the RTC are lower than the RBSL, further site specific modifications could be considered to establish whether the RTC is unnecessarily conservative and these have been marked as draft. Further site specific modifications have not been considered at the present stage.

The RBSL should be used in all cases, except where the RTC is bolded. In this event, the relevant RTC should therefore be adopted.

The background soil concentration and Soil Code have not been considered within the metals RTC presented and therefore the values presented for metals may not be protective of phytotoxic

⁹ In some cases there may be two RTC, where one RTC is higher than the RBSL and the other lower: one may be bolded and the other not and therefore they remain as draft.

effects. The soft landscaping areas should therefore be suitably designed at the remediation design stage, once such areas are defined.

4.1 Comparison of commercial RBSLs and RTC (shallow soil)

The commercial RBSLs and RTC for a shallow soil source are compared in Table 4.1 below.

Table 4.1 – Comparison of commercial RBSLs and RTC for shallow soil (0.65m below FFL)

Contaminant	S106 RBSL (mg/kg)	RTC 1% Sand (mg/kg)	RTC 3% Sandy loam (mg/kg)	Draft/Final
Arsenic	5.00E+02	6.35E+02	6.35E+02	final
Chromium	5.00E+03	3.65E+02	3.65E+02	draft
Cadmium	1.40E+03	2.43E+02	2.43E+02	draft
Mercury (inorganic)	4.80E+02	3.71E+03	3.71E+03	final
Nickel	5.00E+03	1.99E+03	1.99E+03	draft
Selenium	8.00E+03	1.30E+04	1.30E+04	final
Lead	7.50E+02	5.45E+03	5.45E+03	final
Vanadium	1.60E+04	7.59E+03	7.59E+03	draft
Copper	-	1.15E+05	1.15E+05	draft
Zinc	-	9.18E+05	9.18E+05	draft
Benzo(a)pyrene	2.90E+01	2.47E+01	2.48E+01	draft
Benzene	5.00E+00	1.78E+01	9.98E+01	final
Toluene	1.16E+03	4.18E+05 a	4.22E+05 a	final
Ethylbenzene	1.22E+05	1.83E+05 a	1.87E+05 a	final
Xylene	1.21E+05	2.93E+05 a	3.27E+05 a	final
TPH aromatic C7-C8	1.84E+03	4.18E+05 a	4.22E+05 a	final
TPH aromatic C8-C10	9.13E+02	6.21E+04 a	6.62E+04 a	final
TPH aromatic C10-C12	2.65E+04	6.83E+04 a	6.84E+04 a	final
TPH aromatic C12-C16	6.49E+04	6.84E+04 a	6.57E+04	final
TPH aliphatic C6-C8	>1.00E+06	≤1.00E+06 a	≤1.00E+06 a	draft
TPH aliphatic C8-C10	1.59E+05	1.69E+05 a	1.70E+05 a	final
TPH aliphatic C10-C12	1.63E+05	1.71E+05 a	1.71E+05 a	final
TPH aliphatic C12-C16	1.69E+05	1.71E+05 a	1.71E+05 a	final
TPH aromatic C16-C21	5.14E+04	2.85E+04	2.85E+04	draft
TPH aromatic C21-C35	5.14E+04	2.85E+04	2.85E+04	draft
TPH aliphatic C16-C21	>1.00E+06	≤1.00E+06	≤1.00E+06	draft
TPH aliphatic C21-C35	>1.00E+06			draft
Total TPH (Phase 1)	8.14E+04	Not calculated (see note 8)		
Total TPH (Process Area)	4.43E+04			
Total TPH (North Tank Farm)	2.59E+04			

Contaminant	S106 RBSL (mg/kg)	RTC 1% Sand (mg/kg)	RTC 3% Sandy loam (mg/kg)	Draft/Final
Total TPH (South Tank Farm)	3.72E+04			
1,2-Dichloroethane	2.00E+00	4.01E-01	2.15E+00	draft
1,1,1-Trichloroethane	5.77E+05	4.43E+02	3.14E+03	draft
Tetrachloroethene	1.05E+03	1.03E+02	7.88E+02	draft
Trichloroethene	8.40E+01	7.48E+00	5.49E+01	draft
Vinyl chloride	4.00E+00	4.50E-02	1.74E-01	draft
Dichloromethane	1.65E+03	1.58E+02	7.34E+02	draft
Cis-1,2-Dichloroethene	2.73E+02	8.70E+00	5.30E+01	draft
Trans-1,2 Dichloroethene		1.38E+01	8.77E+01	draft
Notes				
a) based on a value produced from following the approach outlined in SR4 for substances at saturation				
1. It is assumed that no visible free product is present within the top 1.0m of soil The presence of free product should be assessed in accordance with information in the S106 (Ref. 1).				
2. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation				
3. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins				
4. In the S106 (Ref. 1), only one value was presented for 1,2-dichloroethene of 273 mg/kg				
5. 'Total' TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.				
6. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach				
7. No RTC was produced for total TPH as this will be considered further at validation stage				
8. Asbestos has not been considered here as it is being considered in a separate report				
9. Additivity for TPHs and PAHs to be undertaken in line with guidance in this report				
10. In the S106 (Ref. 1), “-“ was presented for the RBSLs for copper and zinc for a commercial land use				
11. The values for metals may not be protective of phytotoxic effects				

4.2 Comparison of commercial RBSLs and RTC (deep soil)

The commercial RBSLs and RTC for a deep soil source are compared in Table 4.2 below.

Table 4.2 – Comparison of commercial RBSLs and RTC for deep soil (1m below FFL)

Contaminant	S106 RBSL (mg/kg)	RTC 1% Sandy loam (mg/kg)	RTC 3% Sandy loam (mg/kg)	Draft/final
Benzo(a)pyrene	None	>sat	>sat	final
Benzene	5.00E+00	7.10E+01	1.52E+02	final
Toluene	3.89E+02	>sat	>sat	final
Ethylbenzene	None	>sat	>sat	final
Xylene	None	>sat	>sat	final

Contaminant	S106 RBSL (mg/kg)	RTC 1% Sandy loam (mg/kg)	RTC 3% Sandy loam (mg/kg)	Draft/final
TPH aromatic C7-C8	6.17E+02	>sat	>sat	final
TPH aromatic C8-C10	5.47E+02	>sat	>sat	final
TPH aromatic C10-C12	None	>sat	>sat	final
TPH aromatic C12-C16	None	>sat	>sat	final
TPH aliphatic C6-C8	None	>sat	>sat	final
TPH aliphatic C8-C10	None	>sat	>sat	final
TPH aliphatic C10-C12	None	>sat	>sat	final
TPH aliphatic C12-C16	None	>sat	>sat	final
TPH aliphatic C16-C21	None	Not calculated (see note 3)		
TPH aliphatic C21-C35	None			
TPH aromatic C16-C21	None			
TPH aromatic C21-C35	None			
Total TPH (Phase 1)	8.20E+04	Not calculated (see note 9)		
Total TPH (Process Area)	3.50E+04			
Total TPH (North Tank Farm)	1.40E+04			
Total TPH (South Tank Farm)	3.48E+04			
1,2-Dichloroethane	6.50E-01	1.73E+00	2.75E+00	final
1,1,1-Trichloroethane	3.25E+03	>sat	>sat	final
Tetrachloroethene	3.68E+02	3.98E+02	1.06E+03	final
Trichloroethene	2.80E+01	2.88E+01	7.07E+01	final
Vinyl chloride	1.60E+00	1.54E-01	2.14E-01	draft
Dichloromethane	6.65E+02	6.77E+02	9.76E+02	final
Cis-1,2-Dichloroethene	9.10E+01	3.51E+01	6.70E+01	draft
Trans-1,2 Dichloroethene		5.34E+01	1.11E+02	draft
Notes				
1. Where the lower of the vapour or aqueous saturation limits have been exceeded by the RTC calculated, the hazard quotient is considered to be less than 1 and as such >sat has been presented				
2. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation				
3. TPH >C16 are not considered to be volatile according to the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG). Consequently the inhalation of vapour pathways have not been considered and therefore no RTC value has been presented here				
4. “None” indicates theoretical RBSL greater than solubility limit				
5. In the S106 (Ref. 1), only one value was presented for 1,2-dichloroethene of 91 mg/kg				
6. ‘Total’ TPH RBSL derived for an area of development, based on individual RBSL and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach.				
7. Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach				

Contaminant	S106 RBSL (mg/kg)	RTC 1% Sandy loam (mg/kg)	RTC 3% Sandy loam (mg/kg)	Draft/final
8. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins				
9. No RTC was produced for total TPH as this will be considered further at validation stage				
10. Asbestos has not been considered here as it is being considered in a separate report				
11. Additivity for TPHs and PAHs to be undertaken in line with guidance in this report				
12. The potential presence of free product should be assessed in accordance with information in the S106 (Ref. 1).				

4.3 Comparison of commercial RBSLs and RTC (groundwater)

The commercial RBSLs and RTC for a groundwater source are compared in Table 4.3 below.

Table 4.3 – Comparison of commercial RBSLs and RTC for groundwater (1m below FFL)

Contaminant	S106 RBSL (mg/l)	RTC (mg/l)	Draft/Final
Benzo(a)pyrene	None	>sat	final
Benzene	6.00E+00	1.15E+01	final
Toluene	2.29E+02	>sat	final
Ethylbenzene	5.06E+02	>sat	final
Xylene	6.07E+02	>sat	final
TPH aromatic C7-C8	9.70E+01	>sat	final
TPH aromatic C8-C10	None	>sat	final
TPH aromatic C10-C12	None	>sat	final
TPH aromatic C12-C16	None	>sat	final
TPH aromatic C16-C21	None	Not calculated (see note 6)	final
TPH aromatic C21-C35	None		final
TPH aliphatic C6-C8	None	>sat	final
TPH aliphatic C8-C10	None	>sat	final
TPH aliphatic C10-C12	None	>sat	final
TPH aliphatic C12-C16	None	>sat	final
TPH aliphatic C16-C21	None	Not calculated (see note 6)	final
TPH aliphatic C21-C35	None		final
1,2-Dichloroethane	8.20E-01	4.80E+00	final
1,1,1-Trichloroethane	9.89E+02	>sat	final
Tetrachloroethene	1.15E+02	>sat	final
Trichloroethene	1.30E+01	2.85E+01	final
Vinyl chloride	3.00E-01	3.38E-01	final
Dichloromethane	6.24E+02	1.98E+03	final

Contaminant	S106 RBSL (mg/l)	RTC (mg/l)	Draft/Final
Cis-1,2 Dichloroethene	6.80E+01	7.40E+01	final
Trans-1,2 Dichloroethene	6.80E+01	8.91E+01	final
Notes			
1. Xylene - the lowest RTC of the three isomers has been presented. Users must consider total exposure from all xylene isomers and not consider them in isolation			
2. TPH aromatic C7-C8 is considered to comprise toluene only by Atkins			
3. "None" indicates theoretical RBSL greater than solubility limit			
4. In the S106 (Ref. 1), only one value was presented for 1,2-Dichloroethene of 68 mg/l.			
5. Where indoor and outdoor values were presented by RBCA, these have been integrated in line with SNIFFER (2003). Where both indoor and outdoor values derived by RBCA were greater than the saturation limit, >sat has been presented. Where indoor values were presented by RBCA, and the outdoor values were >sat, only the indoor values have been presented. Therefore >sat indicates that the theoretical RTC is greater than solubility limit.			
6. TPH >C16 are not considered to be volatile according to TPHCWG. Consequently the inhalation of vapour pathways have not been considered			
7. The potential presence of free product should be assessed in accordance with information in the S106 (Ref. 1).			

5. Conclusions and Recommendations

5.1 Commercial RTC

5.1.1 Conclusions

RTC have been derived for a shallow and deep soil source for a commercial land use. As can be seen in Section 4, some RTC were higher than the RBSL and thus the RBSLs would be protective and suitable for use.

In other cases, the RTC were lower than the RBSL and therefore may not be protective of human health based on the assumptions underpinning the RTC. In such cases the RTC have been marked as draft and may require further assessment.

5.1.2 Recommendations

The lower of the RTC/RBSL is recommended for use in order to be protective for the receptor at the site. It is also recommended that the land use assumptions used to develop the CSM are compared to the development plans to establish whether the RTC are suitable for use. For instance, a less permeable soil type than the sand/sandy loam used within the RTC modelling, may result in a higher RTC and less remediation being required. Information regarding the application of the RTC/RBSL is understood to be presented within the remedial strategy and validation plans (as appropriate).

Should exceedances of the RTC/RBSL be reported, it is recommended that the guidelines outlined in the validation plan (in preparation) are followed.

A number of approaches could be considered for those contaminants where the RTC is lower than the RBSL. The recommended approaches include:

- consideration of building development plans on plot specific basis (e.g. areas of hard standing) versus exceedances of RTC/RBSL;



Coed Darcy Monitor

Phase 22 RRWCC
Cordon Sanitaire

FINAL

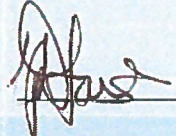
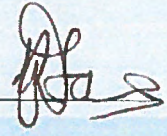
June 2013

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Prepared for:
Coed Darcy Limited

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KINGDOM &
IRELAND



Rev	Date	Details	Prepared by	Checked by	Approved by
1	27 Jun 2013	Original issue	Rhys Mander Senior Consultant	Geoff Jones Managing Principal	Geoff Jones Managing Principal
			Signed: 	Signed: 	Signed: 

URS Infrastructure & Environment UK Limited
1 Drake Walk
Brigantine Place
Cardiff
CF10 4AN
United Kingdom
Tel: +44 (0)2920 465 960
Fax: +44 (0)2920 465 961
www.ursglobal.com

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The methodology adopted and the sources of information used by URS in providing its services are outlined in this Report. The work described in this Report was undertaken between September 2011 and March 2013 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

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Scope

This Redevelopment Remediation Works Completion Certificate (RRWCC) has been prepared with reference to the following agreements:

- Section 106 Agreement dated 8 February 2008 between Neath Port Talbot Borough Council (NPTCBC), St Modwen Developments Limited (SMD), St Modwen Properties Plc (SMP), BP Oil Llandarcy Refinery Limited (BPLR) and Coed Darcy Limited (CDL); and
- Remediation and Maintenance Agreement dated 23 May 2008 (RMA) between SMD, SMP and CDL.

Unless advised otherwise, definitions used in this RRWCC can be found in the Section 106 Agreement and/or the RMA.

This RRWCC has been prepared for Phase 22 in response to the receipt of a written request from SMD pursuant to clause 4.3 of the RMA. The phase boundary and intended use on which this RRWCC is based were notified to URS by letter, a copy of which is provided in **Appendi A**.

The phase boundary for Phase 22 is the land edged in red on drawing no. 5041216-REM-DWG-1280, a copy of which is provided in **Appendi A**. The approximate location of Phase 22 in relation to the Development Boundary is shown in **Figure** below. The area of Phase 22 is approximately 4,520m².

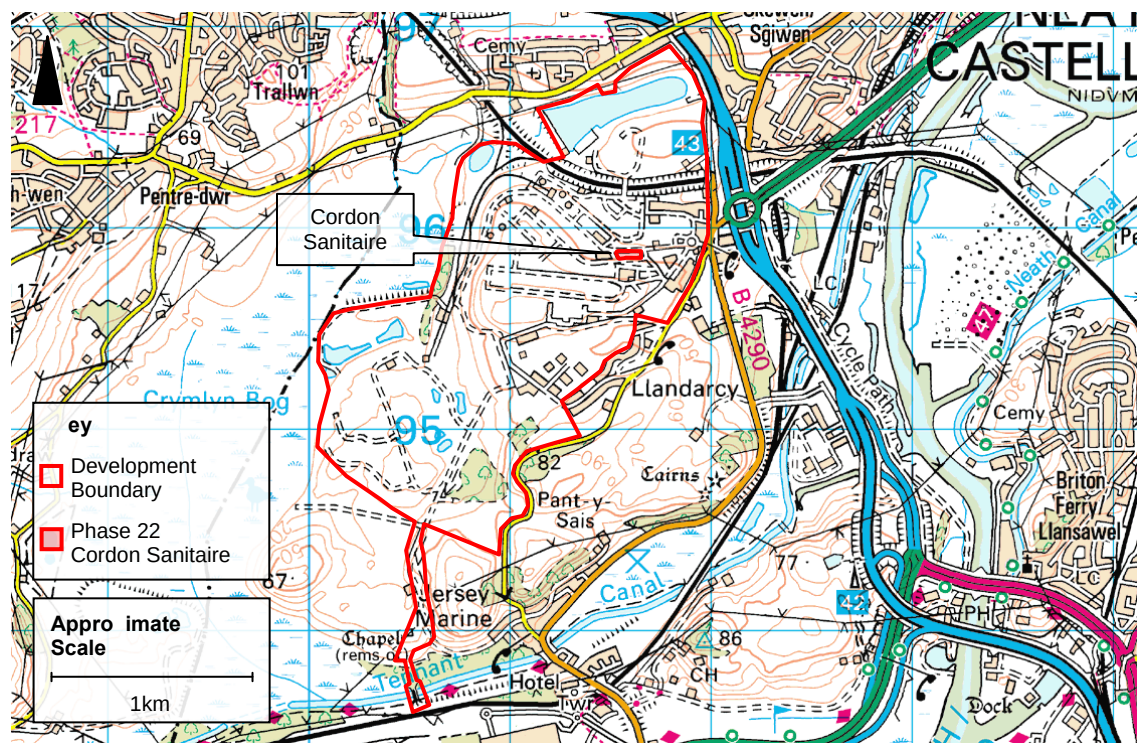


Figure Location plan

The intended use has been declared as 'a multi-storey commercial/office property'. With reference to the definitions provided in the Section 106 Agreement, this is considered to comprise a commercial phase.

Although a development layout is yet to be confirmed, an outline design is shown on Barton Willmore drawing no. 20013/PL-05.4 Revision K, a copy of which is provided in **Appendi A**. An indicative layout is also shown on the current masterplan drawing no. 1332/400/MP/SK/TERT Rev H, a copy of which is also provided in **Appendi A**.

In accordance with the requirements of URS' Deed of Appointment, this RRWCC shall:

- Describe the remedial action which in URS' professional opinion has been carried out for the purposes of completing the Redevelopment Remediation Works in relation to Phase 22; and
- Certify that in URS' professional opinion the Redevelopment Remediation Works have been satisfactorily completed for Phase 22 in accordance with the purpose, objectives and requirements of Schedule 8 of the Section 106 Agreement, having regard to the intended use.

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Objectives of the Redevelopment Remediation Works

Part One of Schedule 8 of the Section 106 Agreement, a copy of which is provided in **Appendi B**, outlines the purpose and objectives of the Redevelopment Remediation Works as follows:

- The purpose and objectives of the Redevelopment Remediation Works are the carrying out of all such remedial action over and above that actually carried out as part of the RAP Works that is necessary in order to make each part of the Property suitable for its intended use. A part of the property will only be suitable for its intended use if and when the Phase Works Completion Date (PWCD) is declared in respect of that part of the Property.
- This objective will be deemed to be met for the purposes of the Section 106 Agreement and the RMA on the date specified in a notice from CDL declaring the PWCD for Phase 22. The PWCD will be declared once CDL is satisfied that the remediation necessary for the specified intended use for the phase has been completed.

Part Two of Schedule 8 of the Section 106 Agreement places a number of obligations on SMD as the Developer. The main obligations pertinent to this phase are as follows:

- The Developer shall carry out or procure the carrying out of all Remedial Action necessary in order to achieve the purpose and objective as outlined in Part 1 of Schedule 8 of the Section 106 Agreement. The design and specification of any remediation shall take account of the principles and objectives and the design assumptions for the RAP Works and shall not prejudice the achievement and future sustainability of these principles and objectives.
- In order to determine the need for Remedial Action in the first place it is necessary to undertake an appropriate site assessment. This assessment needs to take account of the site history, potential and/or actual measured extent of contamination and the associated implied risk. Only by developing a thorough understanding of both potential and actual contamination will it be possible to confirm that all necessary Remedial Action likely to

have been completed. This obligation should be satisfied through completion of an appropriate desk study and intrusive investigation.

- The RBSLs set out in Tables 1 and 2 [in Schedule 8 of the Section 106 Agreement] and the aesthetic criteria, remediation quality and scope (including the depth below Final Finished Level (FFL) to which quality standards are achieved), as the same may be varied in accordance with this Schedule 8, shall be achieved for each part of the Property at the minimum validation frequencies set out in Clause 8 of Part 3 (as applicable depending upon whether such part of the Property is intended for use as residential, commercial or recreational land) as a minimum base level standard.

It should be noted that SMD has procured the services of Atkins Ltd. to assist in discharging the above obligations.

Tables 1, 2, 3 and 4 from Schedule 8 of the Section 106 Agreement are provided below for reference.

Table Summary of Soil RBSLs

Contaminant	Land-Use Specific Soil RBSL Surface to 1m below FFL (mg/kg) ¹			Land-Use Specific RBSL Soil below 1m depth (mg/kg)		
	Residential	Commercial	Recreational	Residential	Commercial	Recreational
<u>METALS & METALLOIDS</u>						
Arsenic	64	500	64	-	-	-
Cadmium	2.6	1400	2.6	-	-	-
Chromium	130	5000	200	-	-	-
Mercury	1	480	1	-	-	-
Nickel	50	5000	75	-	-	-
Selenium	3	8000	3	-	-	-
Lead	337	750	337	-	-	-
Vanadium	416	16000	640	-	-	-
Copper	200	-	200	-	-	-
Zinc	478	-	478	-	-	-
<u>ORGANIC SPECIES</u>						
Benzene	0.12	5	13	0.4	5	48
Benzo(a)pyrene ²	0.9	29	0.9	none	none	none

Contaminant	Land-Use Specific Soil RBSL Surface to 1m below FFL (mg/kg) ¹			Land-Use Specific RBSL Soil below 1m depth (mg/kg)		
	Residential	Commercial	Recreational	Residential	Commercial	Recreational
Toluene	36	1160	8110	52	389	none
Ethylbenzene	41	122000	4740	140	none	none
Xylenes	32	121000	7940	58	none	none
1,2-Dichloroethane	0.04	2	4.5	0.1	0.65	6
Dichloromethane	5	1650	241	84	665	6220
Tetrachloroethene	11	1050	641	34	368	1780
Trichloroethene	1	84	193	2	28	269
Vinyl Chloride	0.01	4	0.7	0.04	1.6	16
1,2 Dichloroethene	4	273	632	7	91	881
1,1,1-Trichloroethane	154	577000	27900	160	3250	none
TPH Aromatic EC>C7-C8	125	1840	21337	146	617	none
TPH Aromatic EC>C8-C10	94	913	4025	257	547	none
TPH Aromatic EC>C10-C12	118	26515	4589	1394	none	none
TPH Aromatic EC>C12-C16	131	64875	4799	none	none	none
TPH Aromatic EC>C16-C21	82	51449	3639	none	none	none
TPH Aromatic EC>C21-C35	1130	51449	3639	none	none	none
TPH Aliphatic EC>C6-C8	8335	8517587	606191	none	none	none
TPH Aliphatic EC>C8-C10	112	158890	12075	158	none	none
TPH Aliphatic EC>C10-C12	3204	163360	12094	none	none	none
TPH Aliphatic EC>C12-C16	4513	169032	12117	none	none	none
TPH Aliphatic EC>C16-C21	94174	3429944	242573	none	none	none
TPH Aliphatic EC>C21-C35	94820	3429944	242573	none	none	none
Total TPH (Phase 1) ³	1717	81413	9061	9182	81956	None
Total TPH (Process Area) ³	2601	44344	10830	4098	35014	None

Contaminant	Land-Use Specific Soil RBSL Surface to 1m below FFL (mg/kg) ¹			Land-Use Specific RBSL Soil below 1m depth (mg/kg)		
	Residential	Commercial	Recreational	Residential	Commercial	Recreational
Total TPH (North Tank Farm) ³	1104	25875	9419	3802	13974	None
Total TPH (South Tank Farm) ²	1015	37230	6349	2792	34797	None
<u>ASBESTOS</u>						
Sum of all Types of ACM	200	300	200	200 ⁴	-	-

Notes

- “-” value not applicable to scenario
- “none” RBSL value exceeds soil saturation limits and free phase assessment appropriate
- 1 Lower value of human health RBSL or Soil Code value if higher than background LCL value (applicable to metals & metalloids only)
- 2 Benzo(a)pyrene RBSL to be compared against sum of 16 US EPA Priority List PAHs using Toxicity Equivalence approach
- 3 ‘Total’ TPH RBSL derived for an area of development, based on individual RBSLs provided and available mass fraction TPH data in soil at time of derivation, using the inverse weighted average approach
- 4 Refer to Section 106 Agreement for specification of relevant depth ranges

Table Summary of RBSLs for groundwater

Contaminant	Land-Use Specific RBSL (mg/l)		
	Residential	Commercial	Recreational
TPH Aliphatic EC>C6-C8	none	none	none
TPH Aliphatic EC>C8-C10	none	none	none
TPH Aliphatic EC>C10-C12	none	none	none
TPH Aliphatic EC>C12-C16	none	none	none
TPH Aliphatic EC>C16-C21	none	none	none
TPH Aliphatic EC>C21-C35	none	none	none
TPH Aromatic EC>C7-C8	20	97	none

Contaminant	Land-Use Specific RBSL (mg/l)		
	Residential	Commercial	Recreational
TPH Aromatic EC>C8-C10	22	none	none
TPH Aromatic EC>C10-C12	none	none	none
TPH Aromatic EC>C12-C16	none	none	none
TPH Aromatic EC>C16-C21	none	none	none
TPH Aromatic EC>C21-C35	none	none	none
Benzene	0.7	6	198
Benzo(a)pyrene	none	none	none
Toluene	47	229	none
Ethylbenzene	102	506	none
Xylenes	43	607	none
1,2-Dichloroethane	0.2	0.82	45
Dichloromethane	150	624	none
Tetrachloroethene	22	115	none
Trichloroethene	2.6	13	813
Vinyl Chloride	0.06	0.3	18
1,2-Dichloroethene	15	68	none
1,1,1-Trichloroethane	193	989	none

otes

“none” theoretical RBSL greater than solubility limit

Table Scale of Aesthetic Criteria

Class	Visual	Olfactory
0	No visible staining of soil, no visible suspect ACM	No detectable odour on soil
1	Occasional staining of soil, no visible suspect ACM	Faint odour on soil
2	Frequent staining of soil	Distinct but not strong odour on soil
3	Occasional heavy staining of soil	Strong odour on soil
4	Heavy staining of soil	Strong odour discernable in ambient air
5	Visible hydrocarbon product	Overwhelming Odour

Notes

Visible suspect ACM refers to asbestos containing material visible to the naked eye which a reasonable and prudent person used to managing asbestos may suspect to be asbestos containing.

Table Minimum Validation Testing Frequencies

Testing for the Validation Suite at the following frequency:	Shallow Soils (Residential <1m FFL)	Deeper Soils (Residential >1m below FFL)	Soils (Commercial all relevant depths)
Imported quarried material	1 per 500m ³ ex situ, composite of 5 regular sub-samples	1 per 1000m ³ ex situ, composite of 5 regular sub-samples	1 per 1000m ³ ex situ, composite of 5 regular sub-samples
Imported soil from verified greenfield site	1 per 250m ³ ex situ, composite of 5 regular sub-samples	1 per 500m ³ ex situ, composite of 5 regular sub-samples	1 per 500m ³ ex situ, composite of 5 regular sub-samples
Imported soil from characterised brownfield site ¹	1 per 25m ³ ex situ, composite of 5 sub-samples	1 per 50m ³ ex situ, composite of 5 sub-samples	1 per 100m ³ ex situ, composite of 5 sub-samples
0.5-1m below FFL in-situ	Regular grid of 1 per 50m ² , sample over 0.5m depth	n/a	Regular grid of 1 per 400m ² , sample over 0.5m depth
>1m below FFL in-situ	n/a	Regular grid of 1 per 100m ² , sample over 1m depth	Regular grid of 1 per 400m ² , sample over 0.5m depth
Stockpiled excavated site materials for re-use	1 per 50m ³ ex situ, composite of 5 sub-samples	1 per 100m ³ ex situ, composite of 5 sub-samples	1 per 400m ³ ex situ, composite of 5 sub-samples
Face of remedial excavations <1m deep	1 per 10m, minimum of 1 per face, worst case VO sample	n/a	1 per 15m, minimum of 1 per face, worst case VO sample
Face of remedial excavations >1m deep	n/a	1 per 10m ² , minimum of 1 per face, worst case VO sample	1 per 15m ² , minimum of 1 per face, worst case VO sample
Along redundant service excavations	1 per 20m of trench, worst case VO sample	1 per 20m of trench, worst case VO sample	1 per 20m of trench, worst case VO sample
Soil treated ex-situ and homogenised	1 per 200m ³ , composite of 5 regular sub-samples	1 per 200m ³ , composite of 5 regular sub-samples	1 per 500m ³ , composite of 5 regular sub-samples

Notes

“1” Validation suite to reflect prior use of the originating brownfield site and the design and purpose of the relevant area of Coed Darcy.

“VO” Visual/olfactory (i.e. aesthetic) observation

Remediation Action Plan (RAP) Works

In addition to meeting the requirements of the Redevelopment Remediation Works, the Developer must also complete a series of statutory remedial works which are referred to as the RAP Works. The requirements for the RAP Works are outlined in Schedule 7 of the Section 106 Agreement.

It is intended that this report, which is the RRWCC, will be complemented by a RAP Works Completion Statement (RAPWCS) in order to provide the information required by CDL to enable the PWCD to be declared.

Details of the scope of works and associated validation completed to satisfy the RAP requirements pertinent to this phase are reported separately in RAPWCS ref. 49310747/BRRP00046/Cert 22a.

Information Sources

URS has been provided with the following Information Sources in relation to Phase 22:

Table Information Sources

Ref.	Document Reference	Format	Title	Author	Date
1	44382742/ BRRP0001	Report	BP Llandarcy Refinery Desk Study	URS	05/07/07
2	5041216-REM- RPT-000216	Report	Derivation of Remediation Target Criteria (Revision 3)	Atkins	19/01/10
3	5041216-REM- RPT-476	Report	Derivation of Commercial Remediation Target Criteria	Atkins	01/01/11
4	5041216-REM- RPT-818	Report	Validation Report Persimmon Phase 1A Cordon Sanitaire (Revision 2)	Atkins	18/03/13
5	5041216- PLOTS-TN-906	Technical Note	Response to Monitor Comments RFI108	Atkins	18/03/13
6	SLS/NW/2161	Letter	Declaration of Phase Letter	SMD	03/06/13

Electronic copies of the Information Sources are provided in **Appendi C**.

Unless otherwise stated, URS has relied solely on the above Information Sources as the basis for issuing this RRWCC. Upon a review of the Information Sources, in URS' reasonable professional opinion, such information and the manner in which it was obtained appears sufficiently up to date, reliable and robust to justify such reliance. No verification of the data has been completed by URS unless noted in the following sections.

Requests for Information RFIs Issued by RS

One RFI was raised by URS in relation to Phase 22, a copy of which is provided in **Appendi** . Copies of the responses received are included in **Appendi C**.

Table RS RFIs

RFI Ref.	Title	Associated Atkins Document	Date Raised	Complete	Comments
108	Review of Atkins' Validation Report	Atkins Validation Report ref. 818	18/10/12	Yes	Refer to Atkins Technical Note 906

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The following section provides a description of the remedial action which has been carried out for the purposes of completing the Redevelopment Remediation Works in relation to Phase 22. This section of the report is structured as follows:

1. Site Assessment
2. Remediation Strategy
3. Redevelopment Remediation Works
4. Validation

Site Assessment

As discussed above, the Section 106 Agreement requires the Developer to undertake an appropriate site assessment which needs to take account of the site history, potential and/or actual measured extent of contamination and the associated implied risk. The Section 106 Agreement also states that only by developing a thorough understanding of both potential and actual contamination will it be possible to confirm that all necessary Remedial Action is likely to have been completed. This obligation should be satisfied through completion of an appropriate desk study and intrusive investigation.

Desk Study

With reference to Atkins' validation report (Information Source 4) it is evident that Atkins has reviewed various information collected during a number of previous desk studies and site investigations within the vicinity of Phase 22 to develop a detailed understanding of both potential and actual contamination. The following is of note:

Atkins reports that Phase 22 occupies a rectangular area of land situated between an existing haul road to the north and west and the proposed Persimmon housing development (Phases 3 and 13) to the south and east.

Historical maps, extracts from which are provided in **Appendix E**, indicate the 'Process Pool Depot' to have been situated within Phase 22. It is understood that this building was a mess room for general labourers. A small number of tanks are also believed to have been present within the western end of Phase 22 based upon the presence of circular concrete bases.

Intrusive Investigations

Details of the findings of intrusive investigations undertaken by Atkins are summarised in Atkins' Validation Report (Information Source 4). URS is satisfied that sufficient intrusive investigations were completed to develop an understanding of the site conditions prior to remediation. The following is of note:

Pre-remediation ground conditions were reported to have comprised granular made ground of varying depths overlying natural cohesive soils above sandstone bedrock generally at shallow depth. Groundwater across Phase 22 is reported to have generally been found to lie within the underlying bedrock.

Evidence of hydrocarbon contamination was reported up to a maximum aesthetic class 4 as defined in Table 3. Akins recommended that the existing soils within Phase 22 should be 'turned over' and replaced, followed by validation in line with the requirements of the Section 106 Agreement.

URS was satisfied that the proposed approach for removing impacted materials from the site was reasonable and that the Redevelopment Remediation Works would achieve the requirements of the Section 106 Agreement.

Remediation Strategy

Schedule 8 of the Section 106 Agreement sets out the minimum remedial action required depending on the intended use and the groundwater regime. As discussed above, Phase 22 is considered to comprise a commercial phase. Groundwater across Phase 22 is primarily in rock i.e. there is little or no soil material over the bedrock and the water table is normally first encountered in bedrock.

Schedule 8 of the Section 106 Agreement does not include specific minimum requirements for commercial end-use where groundwater is primarily in rock as this scenario was not envisaged as part of the masterplan. The Section 106 Agreement does however state that in the event such development is proposed, remedial action consistent with the standards specified in the Section 106 Agreement would be required, adapted as necessary to local conditions. The following minimum requirements specified for a commercial end use where groundwater is in soil are considered appropriate:

- All oil saturated soils and soil containing free product other than minor sheens shall be removed to a minimum depth of 2 m FFL or 0.5 m below the likely lowest seasonal groundwater elevation following development of the intended Urban Village, whichever is the deeper. This depth is to be established by consideration of all available groundwater level monitoring data.
- All soils must meet the RBSL for TPH to at least 1m below FFL.
- All soils must meet in bulk, considering both dispersed fibres and pieces of ACM, the RBSL for ACM to at least 1m below FFL and any visible ACM encountered during construction in the first 1m below FFL is to be removed.
- Where there is a risk of the migration in ground of hazardous gas or contaminated liquid into remediated areas, the Developer shall take all appropriate measures to prevent this occurring. Such measures could include the installation of interception trenches and management of discharge from those. The Developer shall monitor whatever measures are put in place after their installation to continue to demonstrate their effectiveness.
- Where necessary, seeps, sheens and iron rich discharges from the bedrock must be controlled such that there is no visible discharge at surface and little or no odour. Acceptable methodologies for remediation may include, but are not limited to the use of land drainage via interceptors.

Furthermore, Schedule 10 of the Section 106 Agreement states that:

- All buried services shall be removed and the routes of those services shall be backfilled with material no more permeable than the general material in the vicinity.
- Wherever there is a risk that following construction of the Urban Village groundwater or organic phase liquid may contaminate soils within the top one metre below FFL such that any of the relevant RBSLs and/or aesthetic criteria specified in Schedule 8 of the Section 106 Agreement may be exceeded, the Developer shall ensure that all necessary steps are taken to mitigate these risks. Suitable measures may include, but not be limited to, the installation of land drains and/or the raising of the site ground levels such that groundwater will not be able to influence shallow soil quality.
- The final 0.5m of materials shall comprise quality controlled imported fill materials suitable for the use to which they are to be put and of better quality than all RBSLs for the relevant end-use and meeting aesthetic type 0 for residential use and type 1 or better for commercial use as specified in Table 3 of this report.

Based on the above requirements, Atkins' Remediation Strategy recommended the following scope of redevelopment remediation works for Phase 22:

- The removal of identified free product and oil saturated soils to Class 5;
- Turnover of existing soils and the removal of any existing concrete and relict services encountered;
- Re-profiling of the final surface to achieve a stable, free draining surface.

URS considers the above to be in line with the requirements of the Section 106 Agreement.

Redevelopment Remediation works

The redevelopment remediation works that have been completed for Phase 22 are described in Atkins' validation report (Information Source 4) and can be summarised as follows:

- Removal of existing weighbridge, surface hardstanding and existing drainage from beneath former site road – undertaken as part of the Phase 3 remedial works (September to October 2011);
- Turnover and reprofiling of outstanding areas of Phase 22, including the removal of below ground structures, remnant drainage runs and identified hydrocarbon impacted materials (May to June 2012);
- Validation investigation trial pitting (June 2012);
- Localised breakout of shallow bedrock in associated with 'benching' prior to the construction of a proposed embankment (March 2013).

URS considers the above to be in line with the requirements of the Section 106 Agreement.

Atkins reports that approximately 2 litres of product was recovered from borehole MSMW143 between April and May 2012 prior to the remediation works. The product is reported to have been situated within the bedrock at a depth of approximately 3mbgl.

Atkins also reports that during the remediation works approximately 25m³ of unacceptable soils were removed from Phase 22. These soils were reported to be heavily stained with a aesthetic classification of 4 as defined in Table 3.

URS observed the above works and is satisfied that the works appear to have been carried out in accordance with the Remediation Strategy and the requirements of the Section 106 Agreement.

Validation

With reference to Section 2.2 of this report, the following sections aim to demonstrate whether or not the requirements of the Section 106 Agreement have been satisfied.

Aesthetic Criteria

The Section 106 Agreement requires that for a commercial phase all oil saturated soils and soil containing free product other than minor sheens shall be removed to a minimum depth of 2m below FFL or 0.5m below the likely lowest seasonal groundwater elevation, whichever is the deeper.

As discussed above, Atkins reports that approximately 25m³ of unacceptable soils were removed from Phase 22 during the remediation works. Following the works, nine validation trial pits (CSP001 to CSP009) were excavated in May 2012. All nine pits are reported to have been taken to bedrock, which was encountered at depths from 0.4mbgl to 1.4mbgl. Atkins' visual/olfactory records for each of the pits indicate aesthetic classifications of 0/0 as defined in Table 3 for all trial pits.

As discussed above Atkins also reported that approximately 2 litres of product was recovered from borehole MSMW143 between April and May 2012 prior to the remediation works. Subsequent monitoring, from July to August 2012 following the remediation works are reported to have indicated residual thicknesses of product between 5mm to 10mm.

The product is reported to have been situated within the bedrock at a depth of approximately 3mbgl and is therefore deeper than the 2m below FFL threshold specified in the Section 106 Agreement. Furthermore, Atkins reports that an excavation 2.5m to 4.0m deep was opened along the northern (down gradient) boundary of Phase 22 which indicated no evidence of staining or seepages.

Atkins concludes that the residual product observed in borehole MSMW143 is not considered to represent a widespread or significant source of contamination. URS considers this acceptable.

In summary, URS is satisfied that Phase 22 meets an appropriate aesthetic quality given the intended end-use and the requirements of the Section 106 Agreement.

Soil Chemical Quality

The Section 106 Agreement requires that for a commercial phase all soils must meet the RBSLs specified in the Section 106 Agreement at the specified depths and in particular the RBSL for TPH to at least 1m below FFL.

In addition to the RBSLs stated in the Section 106 Agreement, Remediation Target Concentrations (RTCs) have been developed by Atkins. The RTCs are intended to be health protective and it has been agreed previously with NPTCBC's Environmental Health Department that where the RTCs are numerically lower than the RBSLs, the RTCs shall be used. A summary of the RBSLs and RTCs is presented in **Appendix F**.

In order to demonstrate that the requirements of the Section 106 Agreement have been achieved, Atkins undertook a programme of validation trial pitting across Phase 22 and collected soil samples for testing.

With reference to Table 4 in this report, the minimum validation testing frequency for in situ soils within a commercial phase is a regular grid of 1 sample per 400m². From the data presented in Atkins' validation report (Information Source 4) it appears that 13 samples were collected from the nine trial pits. Phase 22 occupies an area of approximately 0.45ha, which implies that a sampling frequency of 1 sample per 348m² has been achieved, which meets the minimum frequency as specified in the Section 106 Agreement. With reference to drawing no. 5041216-PIR(a)-DWG-1243 presented in Atkins' validation report (Information Source 4) URS is satisfied that the samples have been collected across a reasonably regular grid. Atkins reports that there were no exceedances against the RBSL/RTC thresholds.

In summary URS is satisfied that the soils across Phase 22 meet the necessary RBSLs.

Asbestos

For a commercial end use the Section 106 Agreement includes an RBSL for Asbestos Containing Materials (ACM). With reference to Atkins' validation report (Information Source 4) seven samples were collected in January 2013 for asbestos analysis.

All seven samples indicated the presence of asbestos on initial screening. Quantified analysis was carried out on four of the seven samples. Three of the four samples contained less than 10ppm asbestos and one sample contained 18ppm asbestos. This is below the RBSL threshold of 300ppm for a commercial phase.

In summary URS is satisfied that the soils across Phase 22 meet the RBSL for asbestos.

Groundwater Validation Criteria

There are no relevant groundwater validation criteria for a commercial phase and no groundwater validation data has been presented by Atkins.

The Section 106 Agreement states that wherever there is a risk that following construction of the Urban Village groundwater or organic phase liquid may contaminate soils within the top 1m below FFL such that any of the relevant RBSLs and/or aesthetic criteria may be exceeded, then all necessary steps should be taken to mitigate these risks. This may involve the installation of land drains and/or the raising of the site ground levels.

Data indicates groundwater levels to be significantly below the FFL for Phase 22 and therefore the risk of such recontamination is considered low. As such, URS is satisfied that the installation of land drains and/or the raising of the site ground levels is not necessary in relation to Phase 22.

Measures to Prevent Contamination Migration

The Section 106 Agreement states that for a commercial phase, where there is a risk of the migration in ground of hazardous gas or contaminated liquid into remediated areas, the Developer shall take all appropriate measures to prevent this occurring.

Land immediately up-gradient of Phase 22 (i.e. to the south of Phase 22) has been remediated in line with the requirements of the Section 106 Agreement. URS is satisfied that there is little or no risk of migration in ground of hazardous gas or contaminated liquid into Phase 22.

Seepages

The Section 106 Agreement states that for a commercial phase, where necessary, seeps, sheens and iron rich discharges from the bedrock must be controlled such that there is no visible discharge at surface and little or no odour.

No such seepages are reported in Atkins' reports and URS' observations suggest discharge at surface from the bedrock is unlikely.

Imported Fill to Achieve FFL

The Section 106 Agreement requires that the build up of the final elevation after completion of the Redevelopment Remediation Works must comprise a minimum of 0.5m of quality controlled imported fill materials suitable for the use to which they are to be put and of better quality than all RBSLs for the relevant end-use and meeting aesthetic type 1 or better for commercial use.

Atkins' technical note 906 (Information Source 5) states that FFLs are yet to be confirmed but that existing ground levels are likely to be retained. It is assumed that, as for other adjacent remediated phases, the finished ground profile on completion of the remediation works is FFL minus 0.5m.

Should there be any significant change in the development proposals or the proposed FFLs, then reconsideration of the validation data may be necessary. Notwithstanding this it is understood that the remediation works have been completed in a conservative manner to allow for minor alterations to the FFLs.

It should be noted that any subsequent import of material and/or removal of material from the development phase following certification will need to be controlled by the Local Planning Authority as URS will have no formal on-going role to control subsequent works once the RRWCC is issued.

It should be noted that if there is any significant change in the development proposals or the proposed FFLs then reconsideration of the information contained within this report may be necessary.

Removal of Buried Services

The Section 106 Agreement states that irrespective of the intended use, all existing buried services shall be removed. It is assumed that this refers only to redundant services.

With reference to historic plans presented in **Appendix E** there do not appear to be any significant services within Phase 22 other than surface water drainage. As discussed in Atkins' validation report (Information Source 4) Phase 22 was subject to a 'turnover' which involved excavation of all soils to bedrock during which any such services were removed.

URS is satisfied that there do not appear to be redundant buried services present within Phase 22.

CERTIFICATION**Redevelopment Remediation Works**

The following section aims to confirm whether or not in URS' professional opinion the Redevelopment Remediation Works have been satisfactorily completed in accordance with

the purpose, objectives and requirements of Schedule 8 of the Section 106 Agreement, having regard to the intended use, which has been declared as commercial.

Validation is required in order to confirm that the requirements set out in the Section 106 Agreement have been met. With reference to the minimum remedial action required, as listed in Section 2.2 of this report, Table 8 below provides a summary of whether or not in URS' professional opinion these objectives have been satisfied.

Table Certificate Summary

Requirement	Status	Comments
The RBSLs and the aesthetic criteria, remediation quality and scope (including the depth below FFL to which quality standards are achieved) shall be achieved for each part of the Property at the minimum validation frequencies set out in Clause 8 of Part 3 of the Section 106 Agreement (as applicable depending upon whether such part of the Property is intended for use as residential, commercial or recreational land) as a minimum base level standard.	Complete	Refer to Section 2.4 of this report.
All oil saturated soils and soil containing free product other than minor sheens shall be removed to a minimum depth of 2m below FFL or 0.5m below the likely lowest seasonal groundwater elevation following development of the intended Urban Village, whichever is the deeper. This depth is to be established by consideration of all available groundwater level monitoring data.	Complete	Refer to Section 2.4.1 of this report.
All soils must meet the RBSL for TPH to at least 1m below FFL.	Complete	Refer to Section 2.4.2 of this report.
All soils must meet in bulk, considering both dispersed fibres and pieces of ACM, the RBSL for ACM to at least 1m below FFL and any visible ACM encountered during construction in the first 1m below FFL is to be removed.	Complete	Refer to Section 2.4.3 of this report.
Wherever there is a risk that following construction of the Urban Village groundwater or organic phase liquid may contaminate soils within the top one metre below FFL such that any of the relevant RBSLs and/or aesthetic criteria specified in Schedule 8 may be exceeded, the Developer shall ensure that all necessary steps are taken to mitigate these risks. Suitable measures may include, but not be limited to, the installation of land drains and/or the raising of the site ground levels such that groundwater will not be able to influence shallow soil quality.	Complete	Refer to Section 2.4.4 of this report.

Requirement	Status	Comments
Where there is a risk of the migration in ground of hazardous gas or contaminated liquid into remediated areas, the Developer shall take all appropriate measures to prevent this occurring. Such measures could include the installation of interception trenches and management of discharge from those. The Developer shall monitor whatever measures are put in place after their installation to continue to demonstrate their effectiveness.	Complete	Refer to Section 2.4.5 of this report.
Where necessary, seeps, sheens and iron rich discharges from the bedrock must be controlled such that there is no visible discharge at surface and little or no odour. Acceptable methodologies for remediation may include, but are not limited to the use of land drainage via interceptors.	Complete	Refer to Section 2.4.6 of this report.
To provide a minimum thickness of suitable garden soils in residential areas, soils for landscaping in public and commercial areas and sub-base for hardsurfaced areas, the Developer shall build up the final elevation after completion of the RAP and Redevelopment Remediation Works with a minimum of 0.5m of quality controlled imported fill materials suitable for the use to which they are to be put and of better quality than all RBSLs for the relevant end-use and meeting aesthetic type 0 for residential use and type 1 or better for commercial use as specified in Schedule 8 of the Section 106 Agreement. For the avoidance of doubt, the minimum remediation standards set out above therefore assume that the first half metre below FFL will comprise such imported material in all circumstances of residential and commercial end-use.	Complete	Refer to Section 2.4.7 of this report.
Irrespective of the intended use of each phase or part thereof, all existing buried services at the Property shall be removed and the routes of those services shall be backfilled with material no more permeable than the general material in the vicinity. Where backfill to new underground services may become a pathway for residential Pre-Transfer Date Contamination, appropriate control measures such as land drainage or venting measures shall be installed so as to appropriately protect remediated and/or developed areas.	Complete	Refer to Section 2.4.8 of this report.

Preventative Measures

In addition to preparing the RAPWCS and RRWCC, URS is also obliged, if requested by CDL, to review any certificate or other documentation produced to CDL by or on behalf of the Developer purporting to confirm that Preventative Measures have been completed or are not required in relation to any phase or part thereof providing CDL in writing of its professional opinion as to:

- whether the author is suitably qualified to issue the certificate; and
- whether the certificate contains or reflects any manifest error, omission or bias, etc. and certifies that the land is fit for its purpose.

Ground Gas

The Section 106 Agreement states that a proprietary and appropriate ground gas resistant membrane and appropriate venting system shall be installed in all structures that will be entered by people and any structure where there is a potential for gas accumulation if ground gas is present.

Whereas Atkins has not carried out an assessment of ground gases specifically in relation to Phase 22, it is recognised in Atkins' validation report (Information Source 4) that this will need to be addressed as and when the design of the proposed redevelopment is confirmed.

URS shall, if requested by CDL, review any certificate or other documentation purporting to confirm that Preventative Measures have been completed or are not required.

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This RRWCC confirms that in URS' professional opinion, and on the basis of the information provided within the Information Sources and observations made by URS during the remediation works, URS is satisfied that the Phase 22 redevelopment remediation works appear to have been completed in general accordance with the purpose, objectives and requirements of Schedule 8 of the Section 106 Agreement, having regard to the specified intended uses, and that the purpose, objectives and requirements of Schedule 8 of the Section 106 Agreement are likely to continue to be met for the foreseeable future without the need for further remedial action in relation to or affecting the area within the phase boundary.

C

The PWCD will be declared once CDL is satisfied that the remediation necessary for the specified intended use for the phase has been completed. This report, which is the RRWCC, will be complemented by a RAPWCS in order to provide the information required by CDL to enable the PWCD to be declared.

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ST. MODWEN DEVELOPMENTS LIMITED - a ST. MODWEN company

Registration England 892832

Sir Stanley Clarke House, 7 Ridgeway, Quinton Business Park, Birmingham, B32 1AF

T: 0121 222 9400 W: www.stmodwen.co.uk

3rd June 2013

Our ref: SLS/NW/2161

**Coed Darcy Limited
Dumfries House
Dumfries Place
Cardiff
CF10 3ZF**

Dear Sirs

**Coed Darcy
Phase 22 – Persimmon 1a Cordon Sanitaire
Request for Phase Works Completion Date**

We hereby give our written request seeking the declaration of the Phase Works Completion Date for Phase 22 of Coed Darcy as required under Clause 4.6 of the Remediation Agreement made between Coed Darcy Limited, St. Modwen Developments Limited and St. Modwen Properties PLC dated 23rd May 2008.

The Phase 22 boundary is shown on the attached Drawing No. 5041216-REM-DWG-1280.

The "Intended Use" for Phase 22 is confirmed as that of a multi-storey commercial/office property.

As required by the Remediation Agreement, we have copied this letter to the Monitor.

Yours faithfully

Neil Williams

For and on behalf of St. Modwen Developments Limited

Cc Rhys Mander, Llancoed House, Coed Darcy, Neath, SA11 8AZ

St. Modwen Properties PLC

Head Office & Registered Office: Sir Stanley Clarke House, 7 Ridgeway, Quinton Business Park, Birmingham, B32 1AF

T: [0121] 222 9400 W: www.stmodwen.co.uk

Registration: England 349201

ATKINS

5041216-REM-DWG-1280



Key

— Phase Boundary
(Monitor Phase 22)

+ 50.6m



REVISIONS	Drawn By	Checked By	Date

PURPOSE OF ISSUE	Rev.	Authorised for issue	Date

Atkins Limited

Telford Office
Cornerstone House
Stafford Park 13
Telford TF3 3AZ

Birmingham Office
The Axis, 10 Holiday Street
Birmingham
West Midlands B1 1TF

Tel 01952 201234
Fax 01952 200981

©
Tel 0121 483 5000
Fax 0121 483 5252

THIS DRAWING IS NOT TO BE SCALED

CLIENT

ST.MODWEN

PROJECT

Coed Darcy

DRAWING TITLE

Monitor Phase 22 Boundary

SCALES	DRAWN	CHECKED	CO-ORD CHECK
1:750	MJ	AM	ML

DATE	DATE	DATE
26/04/12	26/04/12	26/04/12

SHEET	PLOT DATE
A3	09.08.12

DRAWING NO	REV
5041216-REM-DWG-1280	-

