

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 69 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 the Monitor by letter, a copy of which is provided in **Appendi A**.

The intended use for Phase 69 has been declared as commercial. The phase boundary for Phase 69 is the land edged red on drawing 5041216-REM-DWG-0001971 Rev P2, a copy of which is provided in **Appendi A**. The approximate location of Phase 69 in relation to the Development Boundary is shown in **Figure** below. Phase 69 covers an area of approximately 84,210m².

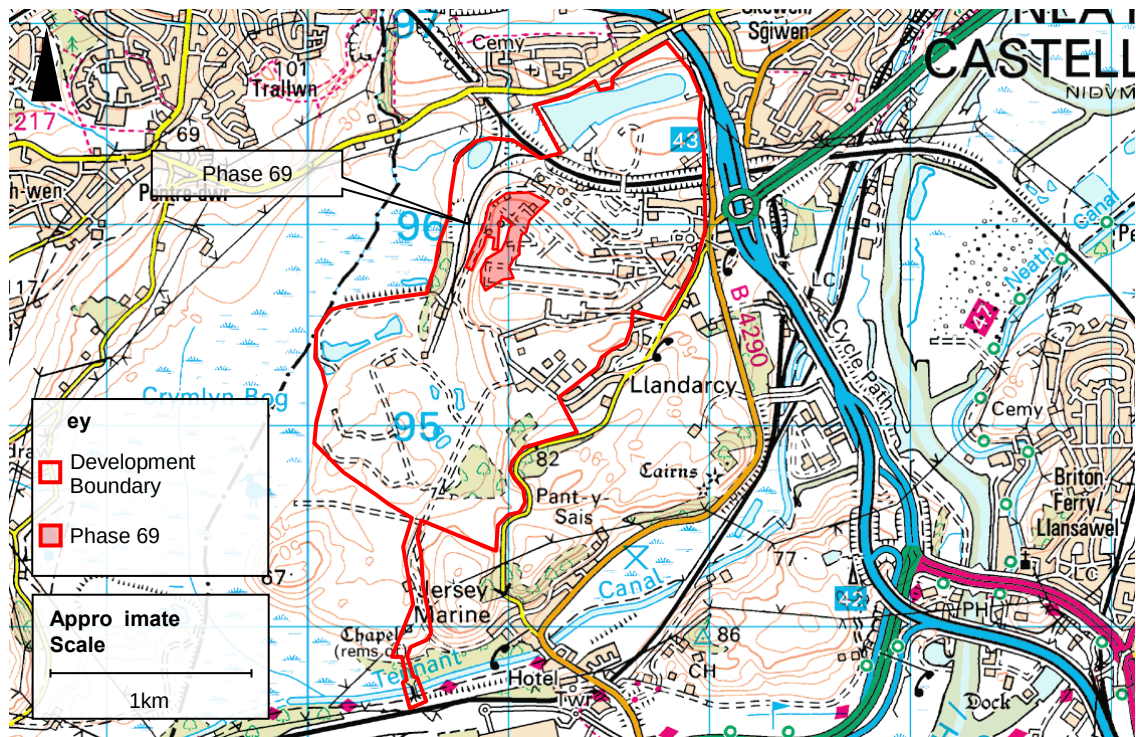


Figure Location plan

A development layout is yet to be confirmed for Phase 69, however an outline layout is shown on the current masterplan drawing reference 1332/400/MP/SK/TERT Revision H, a copy of which is also provided in **Appendi A**.

With reference to the masterplan drawing it should be noted that whereas Phase 69 has been declared as a commercial phase it is shown within an area of proposed residential development. Despite this potential discrepancy, the Monitor is obliged, under the Monitor's Deed of Appointment, to certify the phase against whichever intended use is declared by the developer, irrespective of what is shown on the masterplan. Nevertheless it must be noted that further remediation works will be required if the phase is to be redeveloped for residential use in the future.

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

- Describe the remedial action which in the Monitor's professional opinion has been carried out for the purposes of completing the redevelopment remediation works in relation to Phase 69; and
- Certify whether or not in the Monitor's professional opinion the redevelopment remediation works have been satisfactorily completed for Phase 69 in accordance with the purpose, objectives and requirements of Schedule 8 of the Section 106 Agreement, having regard to the intended use.

A copy of Schedule 8 of the Section 106 Agreement is provided in **Appendix B**.

Bac ground

Objectives of the Redevelopment Remediation Works

Part One of Schedule 8 of the Section 106 Agreement 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 the phase. 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 Risk Based Screening Levels (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 reproduced below for reference.

Table Summary of Soil RBSLs

<i>Contaminant</i>	<i>Land-Use Specific Soil RBSL Surface to 1m below FFL (mg/kg)¹</i>			<i>Land-Use Specific RBSL Soil below 1m depth (mg/kg)</i>		
	<i>Residential</i>	<i>Commercial</i>	<i>Recreational</i>	<i>Residential</i>	<i>Commercial</i>	<i>Recreational</i>
<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
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

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
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
Total TPH (North Tank Farm) ³	1104	25875	9419	3802	13974	None
Total TPH (South Tank Farm) ²	1015	37230	6349	2792	34797	None
ASBESTOS						
Sum of all Types of ACM	200	300	200	200 ⁴	-	-

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“-” 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

<i>Contaminant</i>	<i>Land-Use Specific RBSL (mg/l)</i>		
	<i>Residential</i>	<i>Commercial</i>	<i>Recreational</i>
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
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

<i>Contaminant</i>	<i>Land-Use Specific RBSL (mg/l)</i>		
	<i>Residential</i>	<i>Commercial</i>	<i>Recreational</i>
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

Notes

“none” theoretical RBSL greater than solubility limit

Table Scale of Aesthetic Criteria

<i>Class</i>	<i>Visual</i>	<i>Olfactory</i>
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 discernible 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

<i>Testing for the Validation Suite at the following frequency:</i>	<i>Shallow Soils (Residential <1m FFL)</i>	<i>Deeper Soils (Residential >1m below FFL)</i>	<i>Soils (Commercial all relevant depths)</i>
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

<i>Testing for the Validation Suite at the following frequency:</i>	<i>Shallow Soils (Residential <1m FFL)</i>	<i>Deeper Soils (Residential >1m below FFL)</i>	<i>Soils (Commercial all relevant depths)</i>
Imported soil from characterised brownfield site1	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

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- “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 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/BRRP00154/Cert 69a.

Information Sources

A summary of the information sources that the Monitor has been provided with in relation to Phase 69 is provided below in **Table 1**. Unless otherwise stated, the Monitor has relied solely on these information sources as the basis for issuing this RRWCC. Upon a review of the information sources, in the Monitor's 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 the Monitor unless noted in the following sections.

Electronic copies of the information sources are provided in **Appendix C**.

Table 1 Information Sources

<i>Ref.</i>	<i>Document Reference</i>	<i>Format</i>	<i>Title</i>	<i>Author</i>	<i>Date Received</i>
1	39991-044-785-FR1287	Report	Whole Site Investigation BP Llandarcy Refinery	URS	August 2005
2	44382742/BRRP0001	Report	BP Llandarcy Refinery Desk Study	URS	July 2007
3	5041216-OSW-RPT-0001396	Report	Validation Report Monitor Phase 69 Revision 1	Atkins	October 2015
4	5041216-OSW-TN-0001484	Technical Note	Phase 69 Response to Monitor RFI 0151	Atkins	October 2015

Requests for Information RFIs Issued by the Monitor

The Monitor has raised one RFI in relation to Phase 69, as summarised in **Table 2** below. A copy of the RFI is provided in **Appendix D**. Copies of the responses received are included in the information sources provided in **Appendix C**.

Table 2 RFIs

<i>RFI Ref.</i>	<i>Title</i>	<i>Associated Atkins Document</i>	<i>Date Raised</i>	<i>Complete</i>	<i>Comments</i>
151	Review of Atkins' Validation Report for Monitor Phase 69	Atkins Validation Report for Monitor Phase 69 ref. 5041216-OSW-RPT-0001396	April 2015	Yes	Response to RFI and updated validation report received

DESCRIPTION OF THE REMEDIAL ACTION

The following section provides a description of the remedial action that has been carried out for the purposes of completing the redevelopment remediation works in relation to Phase 69. 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

From the information presented in Atkins' validation report (Information Source 3) it is evident that Atkins has reviewed the findings of previous site investigations and desk studies to develop an understanding of both potential and actual contamination within Phase 69. The following is of note.

Phase 69 lies within the north west of the former Llandarcy Oil Refinery, on the western edge of the upper terrace. With reference to the historical maps presented in **Appendix E** show the area has several historic land uses. These include; a Railcar Loading Depot (and associated tanks), electricity substations, a Sulphur Recovery Unit, storage tanks (kerosene and creosote), a Hydrofiner Unit, Catalytic Reformers, a Catalytic Cracking Plant and a Vacuum Distillation Unit.

With regards geology, Atkins reports that the British Geological Survey Sheet for Swansea (Sheet 247) Drift Edition indicates that this part of the refinery is underlain by Glacial Till (Diamicton) overlying Pennant Sandstone Formation, Hughes Member.

With regards hydrology, groundwater within Phase 69 is generally situated within the underlying bedrock and it is considered likely that groundwater flow is generally towards the northwest. The underlying sandstones are classified as a Secondary A Aquifer, which are defined by the Environment Agency as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers'. The closest surface water body to Phase 69 within the confines of the former refinery is the South Site Reservoir which is located approximately 166m to the northwest of Phase 69. The Crymlyn Bog SSSI is located approximately 85m to the west of Phase 69.

Intrusive Investigations

URS carried out a number of historic site investigations on behalf of the operator of the former refinery, as reported in URS' site investigation report FR1287 (Information Source 1). These investigations included 62 exploratory holes within Phase 69.

Between December 2014 and March 2015 Atkins undertook a site investigation which included the excavation of 521 trial pits within Phase 69. This site investigation was carried out after the removal of historic structures within this area. Details of these site investigations are presented in Atkins' validation report (Information Source 3).

Logs from the trial pits indicate ground conditions to be consistent with the reported geology discussed above. Generally the soils comprised made ground, underlain with glacial soils over sandstone bedrock. Bedrock was predominantly encountered as a weathered zone comprising clayey silty sandy tabular sandstone gravel, cobbles and boulders. Trial pits were terminated on bedrock in seven locations towards the east of Phase 69. Trial pits were terminated on concrete at ground level in 26 locations and terminated below ground level on concrete obstructions in 48 locations.

Land contamination is reported to have been evident within the soils in the form of staining and odours within four trial pits. Laboratory analysis of soil samples collected from the trial pits identified benzene in excess of the adopted thresholds for a commercial end use in one location and for TPH aromatic C8-C10 in four samples. Positive asbestos detections were also reported to have been encountered in 243 of the 458 samples analysed.

The site investigation confirmed that groundwater across Phase 69 was generally found to lie within the underlying bedrock.

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. The intended use for Phase 69 has been declared as commercial and groundwater is primarily in rock, i.e. groundwater is normally first encountered in bedrock. However, the remediation scenarios presented in the Section 106 Agreement do not include a scenario for a commercial end-use where groundwater is in rock, only a commercial end-use where groundwater is in soil.

Atkins therefore proposed that the scenario for a commercial end-use where groundwater is in soil should be amended such that the depth to which the soils must meet the necessary requirements is defined by the surface of the underlying bedrock, rather than being defined by the depth to seasonal groundwater (the Section 106 Agreement specifies a depth of 2m below FFL or 0.5m below the likely lowest seasonal groundwater elevation for a commercial end-use where groundwater is in soil). All other requirements would remain the same.

The Monitor is satisfied with this approach, in that it meets the purpose, objectives and requirements of Schedule 8 of the Section 106 Agreement.

Therefore, with reference to the requirements that are specified in Schedule 8 of the Section 106 Agreement, amended as detailed above, the minimum requirements are as follows:

- 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.
- All oil saturated soils and soil containing free product other than minor sheens shall be removed from ground level down to the surface of the underlying bedrock.
- 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 asbestos containing material (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 sets out additional generic remedial requirements, the following of which are relevant to Phase 69:

- 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
- 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.
- 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.

Based on the above requirements and the data collected during their site investigations, Atkins proposed further investigation and/or remediation works in locations where there was:

- The presence of hydrocarbon sheens or free product on ingressing water;
- The presence of identified RBSL exceedances within existing soils;
- Elevated aesthetic criteria scores; and
- The presence of pipework identified in situ during the trial pitting.

The Monitor considered the above approach to be acceptable in accordance with the requirements of the Section 106 Agreement.

Redevelopment Remediation works

The redevelopment remediation works that have been completed for Phase 69 are described in Atkins' validation report (Information Source 3) and can be summarised as follows:

- Removal of two oil barrels and locally impacted surrounding soils;
- Hotspot excavation of materials in line with exceedances of the RBSL for TPH C8-C10 Aromatic in four locations (TPE2680, TPE2779, TPE2780 and TPE3157);
- Removal of pipework that had been identified in 22 locations;
- Investigation of historical electricity substations; and
- Break out and investigation of areas where concrete obstructions were encountered.

The Monitor attended site and was generally satisfied that the above works were being carried out appropriately and that the requirements of the Section 106 Agreement were likely to be achieved.

It should be noted that the remediation works that have been carried out were focused on addressing areas of concern that had been identified in the site investigation, rather than a more general turnover of soils as has been seen on a number of previous Phases elsewhere on site. Whereas these previous Phases involved a wider stripping of soils, allowing a more comprehensive inspection of the soils and increased confidence over the presence of contamination, the trial pit based approach adopted on this Phase means there is an inherent risk that contamination may have been missed. Nevertheless, the testing frequencies specified in the Section 106 Agreement are relatively conservative, and furthermore the ground investigation was undertaken in line with the residential testing frequencies, rather than the commercial frequencies, which improves confidence and reduces the likelihood that contamination could have been missed. Furthermore the Section 106 Agreement does not specify the exact manner in which the works should be undertaken, so the Developer has not contravened any of the requirements. The Monitor is therefore satisfied that the works have been undertaken in accordance with the requirements of the Section 106 Agreement.

Validation

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

It should be noted that in the absence of a detailed layout for the proposed development and confirmed FFLs, it has been assumed that the ground levels following the completion of the redevelopment remediation works represents FFL minus 1m. A topographical record of the ground levels upon which this certificate is based are shown on drawing 5041216-ATK-DR-C-REM-2126 Rev P1 a copy of which is provided in **Appendix F**.

Aesthetic Criteria and the Removal of Oil Saturated Soils

The Section 106 Agreement, as amended as described in Section 2.2 of this report, requires that for a commercial phase all oil saturated soils and soil containing free product other than minor sheens shall be removed from ground level down to the surface of the underlying bedrock.

During the site investigation, soils were logged in accordance with the aesthetic criteria listed in **Table 1** of this report. Soils achieving an aesthetic classification of 5 (visible hydrocarbon product and/or overwhelming odour) were deemed to comprise oil saturated soils and/or soil containing free product and were therefore unsuitable for retention.

Atkins reports that following the completion of the redevelopment remediation works the highest recorded visual/olfactory classification was 4 and the soils were therefore suitable for retention based on the specified aesthetic criteria. The Monitor is satisfied that the trial pit logs provided in Atkins' validation report (Information Source 3) appear to confirm the absence of oil saturated soils and soil containing free product within Phase 69.

In summary, the Monitor is satisfied that oil saturated soils and soil containing free product appear to have been removed from Phase 69.

Soil Chemical Quality and Testing Frequencies

The Section 106 Agreement requires that all soils must meet the RBSLs at the specified depths and in particular the RBSL for TPH to at least 1m below FFL. It should be noted that in addition to the RBSLs specified in the Section 106 Agreement, Atkins has also developed Remediation Target Concentrations (RTCs). These RTCs are intended to be health protective and it has been agreed with NPTCBC that where the RTCs are more conservative than the

RBSLs, then the RTCs shall take precedence. A summary of the RBSLs and RTCs is presented in **Appendix** .

With regards to the requirement to achieve the RBSL for TPH to at least 1m below FFL, given that the ground profile upon which this certificate is based represents FFL minus 1m, this requirement is not considered to be relevant to this phase and therefore only the RBSL/RTCs for deep commercial soils have been considered.

The Section 106 Agreement also requires that the soils must be tested in accordance with the specified minimum validation testing frequencies set out in **Table** in this report. With reference to that table, the following testing frequencies are considered to be relevant to Phase 69:

- In situ soils are to be tested on a regular grid at a minimum frequency of 1 per 400m², irrespective of the depth below FFL; and
- The faces of remedial excavations are to be tested at a minimum frequency of 1 per 15m², with a minimum of 1 sample per face.

Atkins reports that soil samples were collected from a total of 521 trial pits that were excavated across Phase 69, the area of which is approximately 84,210m². This equates to a testing frequency of 1 per 162m² which is compliant with the minimum testing frequency specified in the Section 106 Agreement of 1 per 400m².

It should be noted that the testing frequency that has been achieved significantly exceeds the minimum testing frequency for a commercial phase. The reason for this is that at the time of the site investigation the intention was for Phase 69 to be declared as a residential phase in accordance with the masterplan. However, it was later decided to declare the phase for a commercial end-use. Furthermore Atkins reports that only 73,500m² of Phase 69 is considered to be accessible for commercial land use, however this certificate considers the entire phase given that the final development proposals are yet to be confirmed.

Drawing 5041216-REM-DWG-002117 Rev P1 presented in Atkins' validation report (Information Source 3) indicates that the trial pits were excavated across Phase 69 on a reasonably regular grid, however it is noted that one area, highlighted with an orange hatch, was not validated.

Atkins states that this area has not been validated because it is being used as a knotweed treatment area and will continue to be so for the foreseeable future. The treatment area covers an area of approximately 2,500m². Whilst the presence of knotweed is not itself a reason to withhold the RRWCC, the fact that the underlying soils may not have been appropriately validated, is more of a concern.

With reference to the historical maps, Atkins reports that the area was previously used as a sulphur recovery unit. Atkins has reviewed the historical site investigations undertaken by URS which included two trial pits and one borehole in this area. Atkins reports that free phase hydrocarbon was not recorded. Atkins also makes reference to the recent site investigations that were completed around the perimeter of this area, both up-gradient and down-gradient. Atkins reports that again, no free phase hydrocarbon was noted. This would appear to suggest that the area is likely to be acceptable for commercial end use.

As discussed in Section 2.3 of this report, soils were removed from four remedial excavations around the locations of TPE2680, TPE2779, TPE2780 and TPE3157. Atkins reports that these excavations were extended until visual and olfactory evidence suggested that the hotspot has been completely removed. Soil samples were also collected from the remediation excavations in order to demonstrate the acceptability of the remaining soils. Atkins reports that these samples were collected in accordance with the minimum testing frequencies

specified in the Section 106 Agreement. It should be noted that the remediation excavations have been left open, so there was no requirement to validate imported soils.

Atkins reports that laboratory analysis of the soil samples collected from the original trial pits and the validation samples collected from the remedial excavations indicated that the soils achieved the necessary RBSLs/RTCs for deep soils in a commercial phase and were therefore suitable for retention.

In summary, the Monitor is satisfied that the soils within Phase 69 meet the necessary chemical quality requirements as specified in the Section 106 Agreement. It should however be noted that if the development layout and proposed FFLs differ significantly from the assumed FFLs, or if the intended use should change, then further remediation works will be required.

Groundwater Quality

In addition to the RBSLs for soils, the Section 106 Agreement also specifies RBSLs for groundwater as detailed in **Table** in this report. However the Section 106 Agreement does not envisage the remediation of groundwater contamination within bedrock, so long as it is controlled, for example seeps, sheens and iron rich discharges from bedrock must be controlled such that there is no visible discharge at surface and little or no odour.

Atkins does not report the collection of any groundwater samples from the recent site investigations carried out within Phase 69. However, from the observations reported in Atkins' validation report, it does not appear that any control measures are considered necessary to control seeps, sheens and iron rich staining or prevent discharge at ground surface. Given the depth of groundwater in relation to the FFL it is considered unlikely that any such seepages would discharge at surface.

The Monitor is satisfied that groundwater quality is unlikely to have a detrimental impact on Phase 69 and no further control measures are considered necessary in relation to the management of seeps, sheens and iron rich discharges.

Measures to Prevent Contamination Migration

The Section 106 Agreement states that 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.

As discussed in Section 2.1.1 of this report, groundwater flow within Phase 69 is likely to be towards the northwest. Given the absence of free product and oil saturated soils within Phase 69, the recontamination of down gradient areas is considered unlikely. Therefore measures to prevent the migration of contamination are not considered necessary for Phase 69.

In summary the Monitor is satisfied that there is minimal risk of migration in ground of hazardous gas or contaminated liquid into our out of Phase 69 and therefore no measures are considered necessary to prevent the recontamination of soils.

Asbestos

The Section 106 Agreement requires that 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 that any visible ACM encountered during construction in the first 1m below FFL must be removed.

Given that the ground profile upon which this certificate is based represents FFL minus 1m, it is not necessary for the soils to meet the specified requirements in relation to asbestos. Nevertheless, Atkins has assessed the soils, as follows.

Atkins reports that one metal pipe with possible asbestos lagging was removed from Phase 69. A total of 458 soil samples that were collected during the site investigations received a routine asbestos screening and asbestos fibres were detected in 243 of the samples. However it does not appear that these samples received a quantitative assessment due to them being at depths greater than 1m below FFL.

Atkins reports that a further 55 soil samples were collected during the additional remedial works and asbestos fibres were detected in nine samples following a routine asbestos screening. All nine samples received quantitative analysis and Atkins reports that the recorded concentrations were less than the permitted RBSL of 0.03% for shallow soils less than 1m below FFL within in a commercial area and the soils were therefore considered suitable for retention.

In summary, the Monitor is satisfied that the soils within Phase 69 appear to meet the necessary requirements for asbestos in accordance with the Section 106 Agreement.

Removal of Buried Services

The Section 106 Agreement states that irrespective of the intended use, all existing buried services shall be removed.

Atkins reports that pipework was encountered in 22 locations during the site investigation. Of these 22 locations, three were clay pipes, six were metal pipes and 13 were just described as 'pipe'. Pipework was removed during further investigation. Atkins does not report the discovery of any other buried services within Phase 69.

The Monitor is satisfied that the buried services that were encountered during the site investigation appear to have been removed from Phase 69. However, given the nature of the site investigation it is considered possible that other buried services could have been missed and may still be present within Phase 69.

Recontamination of Soils

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.

Observations during the works indicate groundwater levels to be significantly below the FFL and therefore the risk of recontamination of the top 1m of soils is considered unlikely. As such, the Monitor is satisfied that the installation of land drains and/or the raising of the site ground levels is not necessary in relation to this phase.

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' validation report states that the post-remediation ground levels upon which this certificate are based generally represent FFL minus 1m and therefore the top 1m of soils, including the top 0.5m of quality controlled imported fill materials, are yet to be placed. As such this requirement is yet to be met for this phase.

A topographical record of the ground levels upon which this certificate are based is shown on drawing 5041216-ATK-DR-C-REM-2126 Rev P1 a copy of which is provided in **Appendi F**.

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 certificate will be necessary. Furthermore, any subsequent import of material and/or removal of material from the phase following certification will need to be controlled by the Local Planning Authority as the Monitor will have no formal on-going role to control subsequent works once this RRWCC has been issued.

CERTIFICATION

Redevelopment Remediation works

The following section aims to confirm whether or not in the Monitor's 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. **Table** provides a list of the minimum remedial action required for a commercial phase where groundwater is in rock, as described in Section 2.2 of this report, and summarises whether or not each requirement has been achieved.

Table Certificate Summary

<i>Requirement</i>	<i>Status</i>	<i>Comments</i>
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 from ground level down to the surface of bedrock.	Complete	Refer to Section 2.4.1 of this report.
All soils must meet the RBSL for TPH to at least 1m below FFL.	Not applicable	The top 1m of soils is yet to be placed. Refer to Section 2.4.2 of this report.
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 2.4.4 of this report.

<i>Requirement</i>	<i>Status</i>	<i>Comments</i>
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.	Not applicable	The top 1m of soils is yet to be placed. 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 2.4.3 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 2.4.6 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 2.4.7 of this report.

Requirement	Status	Comments
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.	Not applicable	The top 1m of soils is yet to be placed. Refer to Section 2.4.8 of this report.

Preventative Measures

In addition to preparing the RAPWCS and RRWCC, the Monitor 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.

The Monitor has not received any such documentation or requests in relation to Phase 69.

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.

Atkins is yet to undertake a detailed ground gas assessment for Phase 69 but this will be necessary in order to specify appropriate gas and vapour protection measures. Such measures will need to be agreed with the relevant regulatory authorities prior to installation.

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This RRWCC confirms that in the Monitor's professional opinion, and on the basis of the information provided within the information sources as well as observations made by the Monitor on site during the remediation works, the Monitor is satisfied that the Phase 69 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.

It should be noted that Phase 69 is hereby certified as a commercial phase, which differs from the residential end-use shown on the current masterplan. If Phase 69 is developed as a residential phase then further redevelopment remediation works will be required. The scope of such works will need to be agreed with the Local Authority as the Monitor will have no formal on-going role to control subsequent works once this RRWCC has been issued.

C

The PWCD will be declared once CDL is satisfied that the remediation necessary for the specified intended uses 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

Park Point, 17 High Street, Longbridge, Birmingham, B31 2UQ

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

21st May 2015

Our ref:

Coed Darcy Limited
Dumfries House
Dumfries Place
Cardiff
CF10 3ZF

Dear Sirs

Coed Darcy
Monitor Phase 69
Request for Phase Works Completion Date

We hereby give our written request seeking the declaration of the Phase Works Completion Date for Monitor Phase 69 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 69 boundary is shown on the attached Drawing No. 5041216-REM-DWG-1971.

The "Intended Use" for Phase 69 is assumed as that of proposed commercial end use.

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

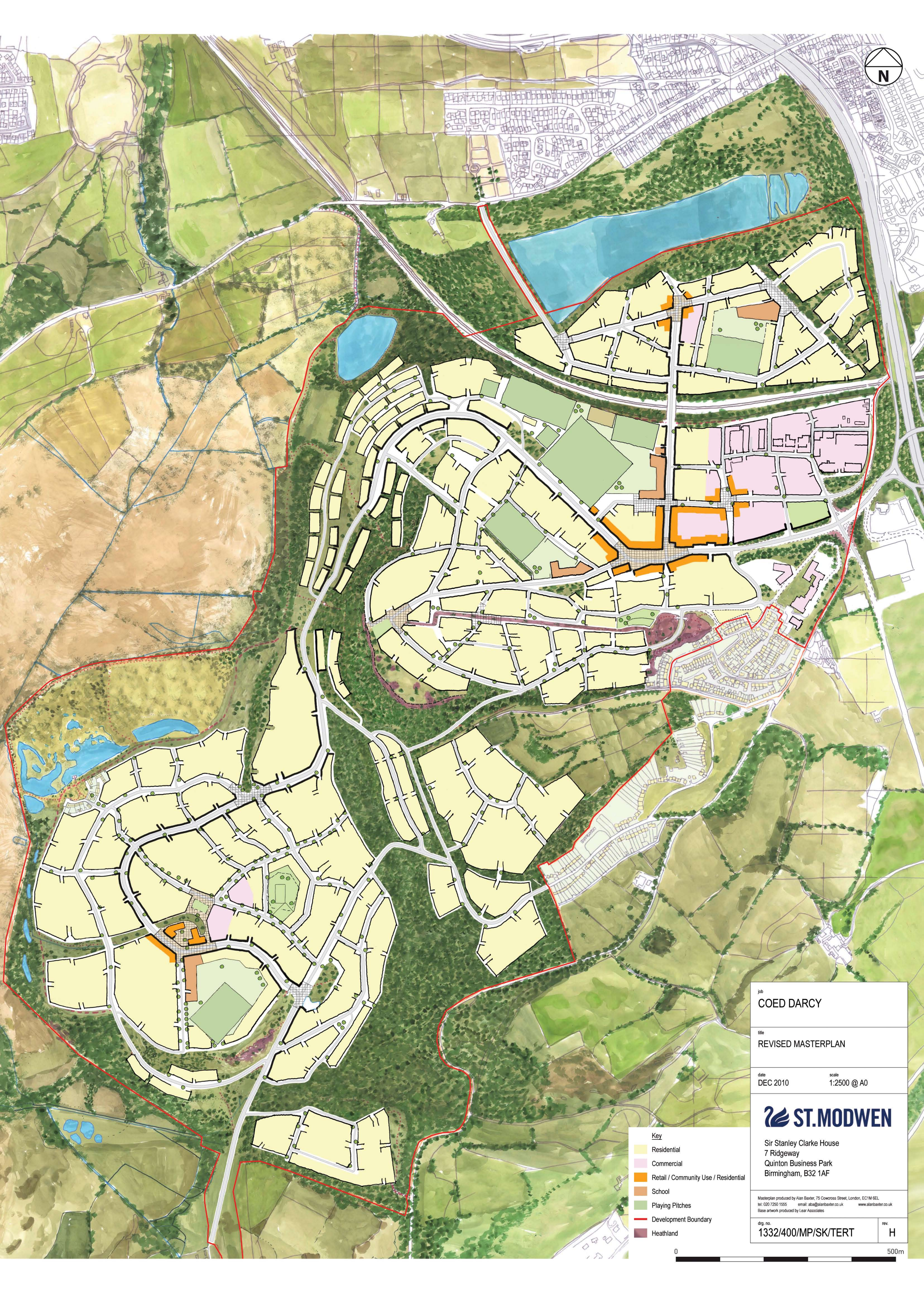
Cc Rhys Mander, Llancoed House, Coed Darcy, Neath, SA11 8AZ

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



- Key**
- Residential
 - Commercial
 - Retail / Community Use / Residential
 - School
 - Playing Pitches
 - Development Boundary
 - Heathland

job COED DARCY	
title REVISED MASTERPLAN	
date DEC 2010	scale 1:2500 @ A0
 ST.MODWEN	
Sir Stanley Clarke House 7 Ridgeway Quinton Business Park Birmingham, B32 1AF	
Masterplan produced by Alan Baxter, 75 Cowcross Street, London, EC1M 6EL tel: 020 7250 1555 email: aba@alanbaxter.co.uk www.alanbaxter.co.uk Base artwork produced by Lear Associates	
drp. no. 1332/400/MP/SK/TERT	rev. H

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A E I B SC E LE OF T E SECTION A REE E T

SCHEDULE 8

Redevelopment Remediation Works

Purpose, objectives and requirements of the Redevelopment Remediation Works

Part 1

1. Purpose and objectives of the Redevelopment Remediation Works

- 1.1 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 within the meaning of paragraph 1.2 below for its Intended Use or such other use as may be determined from time to time.
- 1.2 A part of the Property will only be suitable for its Intended Use or such other use as may be determined from time to time if and when the Phase Works Completion Date is declared in respect of that part of the Property.

Part 2

2. Developer's obligations regarding Redevelopment Remediation Works

- 2.1 The Developer shall carry out or procure the carrying out of all Remedial Action necessary in order to achieve the purpose and objectives set out in Part 1 of this Schedule.
- 2.2 The design and specification of the Redevelopment Remediation Works shall take appropriate account of the principles and objectives (as set out in sub-paragraph 1.3 (including 1.3.1-1.3.5 thereof) of Schedule 7 hereto) and the design assumptions of the RAP Works and shall not prejudice the achievement and future sustainability of these principles and objectives of the RAP Works or the RAP Works themselves.
- 2.3 The Redevelopment Remediation Works may reduce the reliance on the RAP Works to achieve the principles and objectives of the RAP Works set out in sub-paragraph 1.3 (including 1.3.1-1.3.5 thereof) of Schedule 7 hereto but must not increase that reliance.
- 2.4 The RBSLs set out in Tables 1 and 2 below and the aesthetic criteria, remediation quality and scope (including the depth below Final Finished Level to which quality standards are achieved) as also set out in Part 3 below, 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.
- 2.5 Without prejudice to the requirement to achieve the RBSLs set out in Tables 1 and 2 as a minimum base level standard, the Developer shall ensure that all necessary remediation targets are developed and used to determine the extent and quality of remediation appropriate to the development design and purpose of the Urban Village and the Pre-Transfer Date Contamination.
- 2.6 The Developer shall promptly notify CDL and the Monitor if at any time it or any person acting on its behalf identifies a substance present at, in, on or under the

Property, or has reasonable cause to suspect such presence, for which no RBSL is specified in Tables 1 or 2 of Part 3 below in which case the following procedure shall apply:

- 2.6.1 As soon as reasonably practicable after serving a notice under paragraph 2.6 above, the Developer shall prepare proposals for soil and groundwater RBSLs for the substance identified that are consistent with the purpose and objectives of the Redevelopment Remediation Works as set out in Part 1 of this Schedule and the standards of prevailing Environmental Law and shall provide a copy of such proposals to CDL the Monitor and the Authority. Any such proposal shall contain a detailed statement of the health risk assessment and general methodology from which the proposed RBSLs have been derived.
 - 2.6.2 Not earlier than 10 Working Days after submitting its proposals to CDL the Monitor and the Authority in accordance with sub-paragraph 2.6.1 above, the Developer shall submit a written request to the appropriate Environmental Authorities, copied at the same time to CDL the Monitor and the Authority, for approval of the use of the proposed RBSLs. The Developer shall provide to the appropriate Environmental Authorities with its request copies of the health risk assessment and general methodology referred to in sub-paragraph 2.6.1 above and a copy of this Agreement clearly drawing attention to the purpose, objectives and requirements of the Redevelopment Remediation Works set out therein and the proposed changes thereto.
 - 2.6.3 Each of the Developer, CDL and the Monitor shall be free at any time to make such submissions to the appropriate Environmental Authorities in relation to the Developer's proposals as they see fit, provided such submissions are made in writing and copied to each other and the Authority at the same time.
 - 2.6.4 The Developer shall ensure that the Redevelopment Remediation Works achieve compliance with any RBSLs approved in writing by the appropriate Environmental Authorities pursuant to this paragraph 2.6, as if they were also set out in Tables 1 and 2 of Part 3 of this Schedule.
- 2.7 The Developer may at any time propose variations to the requirements of clauses 3 to 8 inclusive of this Schedule 8 below to the appropriate Environmental Authorities and to the Authority pursuant and to the extent required to comply with the Planning Permission to take account of changes of circumstances since the date of this Agreement, provided no variation shall be proposed that is in any way prejudicial to the achievement of the purpose and objectives of the Redevelopment Remediation Works as set out in Part 1 above and, in particular, the achievement of the RBSLs set out in Tables 1 and 2 above (as previously amended in accordance with paragraph 2.6 above if applicable) and provided further that
- 2.7.1 Any such proposals shall be submitted in writing to CDL the Monitor and the Authority at least 10 Working Days before they are submitted to any Environmental Authority;
 - 2.7.2 Any such proposal submitted to any Environmental Authority shall be copied to CDL the Monitor and the Authority at the same time;
 - 2.7.3 The Developer shall enclose a copy of this Agreement with any such proposal made to any Environmental Authority clearly drawing attention to the

purpose, objectives and requirements of the Redevelopment Remediation Works set out therein and the proposed changes thereto;

- 2.7.4 Each of the Developer, CDL and the Monitor shall be free to make such submissions to the appropriate Environmental Authorities in relation to the Developer's proposals as they see fit, provided such submissions are made in writing and copied to each other and the Authority at the same time.
 - 2.7.5 Subject to paragraph 2.7.6 no such proposed variation shall be implemented unless, it has been approved in writing by the appropriate Environmental Authorities in accordance with the requirements of this clause 2.7.
 - 2.7.6 If the Developer has only oral approval (or non objection) to a proposed variation from the relevant Environmental Authorities, no such proposed variation shall be implemented unless the Developer notifies the relevant Environmental Authorities in writing (copied at the same time to CDL the Monitor and the Authority) that it proposes to proceed with the implementation of the proposed variation to the Redevelopment Remediation Works 10 Business Days after the date of such notice and no written objections of any relevant Environmental Authority are received within such 10 Business Day period in respect of the same.
 - 2.7.7 Any reference in this Agreement to the Redevelopment Remediation Works shall be to the Redevelopment Remediation Works as varied in accordance with this paragraph 2.
- 2.8 The Developer shall, and shall procure that any person acting on its behalf in relation to any aspect of the Redevelopment Remediation Works required by this Schedule 8 shall, at all times comply with the requirements of Schedule 10 (General Remediation Requirements).

Part 3

Table 1 – 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
METALS & METALLOIDS						
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	478	-	478	-	-	-
Zinc	200	-	200	-	-	-
ORGANIC SPECIES						
Benzene	0.12	5	13	0.4	5	48
Benzo(a)pyrene ²	0.9	29	0.9	none	none	none
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
Total TPH (North Tank Farm) ³	1104	25875	9419	3802	13974	none
Total TPH (South Tank Farm) ²	1015	37230	6349	2792	34797	none
ASBESTOS						
Sum of all Types of ACM	200	300	200	200 ⁴	-	-

“-“ value not applicable to scenario

“none” RSBL 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 See text below for specification of relevant depth ranges

Table 2 – 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
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

“none”= theoretical RBSL greater than solubility limit

3. Scale of aesthetic criteria

Table 3 – 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

3.1 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.

3.2 All references in Table 1 above to depths to which minimum RBSLs are to be achieved are expressed below, relative to FFL following completion of construction of the intended Urban Village.

4. Residential End-Use where Groundwater is Primarily in Rock

4.1 This remediation scenario is intended to refer to residential end-use in areas where there is limited soil material over bedrock, little perched groundwater is present in that soil, and the water table is normally first encountered in bedrock. Areas of the Property with these characteristics include the more elevated parts of the former process area and of the southern tank farm. The minimum Remedial Action required in this scenario is as follows:

4.2 All oil saturated soil should be removed.

4.3 All soils must be remediated so as to meet the RBSLs for TPH, BTEX and PAHs at the relevant depth relative to FFL and the aesthetic criteria Class 2 or better at greater than 1m below FFL.

4.4 The aesthetic quality of soils shall be Class 1 or better for at least the first metre below FFL.

4.5 Soils where there is visible ash and clinker, or metal concentrations above RBSLs, are to be removed so that none is retained within the first metre below FFL in garden areas.

4.6 Where it is not practicable to address groundwater contamination within bedrock this must be controlled, e.g. where seeps, sheens and iron staining discharge from the bedrock. Acceptable methodologies for remediation may include, but are not limited to, the use of land drainage via interceptors. Control measures should result in no visible discharge at surface and little or no odour observable.

4.7 All soil potentially containing dispersed asbestos fibres or visible ACM must be removed or remediated to meet in bulk, considering both dispersed fibres and pieces

of ACM, the appropriate ACM RBSL, or to meet the requirements of relevant Environmental Authorities, whichever is the more conservative.

5. Residential End-Use where Groundwater is in soil

- 5.1 This remediation scenario is intended to refer to residential end-use in areas where there is sufficient soil material over bedrock to commonly contain perched groundwater such that the water table is normally first encountered in soil. Areas of the Property with these characteristics include the lower parts of the former process area and of the southern tank farm and the north site tank farm. The minimum Remedial Action required in this scenario is as follows.
- 5.2 All oil saturated soils and free product shall be removed.
- 5.3 Soils must be remediated so as to meet the RBSLs for TPH, BTEX and PAHs to a minimum depth of 0.5m below the likely seasonal minimum groundwater depth following development of the intended Urban Village. This depth is to be established by consideration of all available groundwater level monitoring data relevant for each area. All soil must meet aesthetic criteria Class 2 or better to the same depth.
- 5.4 All soil must meet aesthetic criteria Class 1 or better to at least 1m below FFL.
- 5.5 Soils where there is visible ash and clinker or metal concentrations above RBSLs to be replaced to at least 1m below FFL.
- 5.6 All soil potentially containing dispersed asbestos fibres or visible ACM must be removed or remediated to meet in bulk, considering both dispersed fibres and pieces of ACM, the appropriate ACM RBSL, or the requirements of relevant Environmental Authorities, whichever is the more conservative, to a minimum depth of 2m below FFL.
- 5.7 Where there is a risk of the migration in ground of hazardous gas or vapour or contaminated liquid into remediated areas, the Developer shall take all necessary measures appropriate to prevent this occurring, including monitoring whatever measures are put in place after their installation to continue to demonstrate their effectiveness. Such measures could include the installation of interception trenches and management of discharge from these.
- 5.8 Where necessary, seeps, sheens and iron rich discharges from the bedrock must be permanently controlled such that there is no visible discharge at surface and little or no odour detectable. Acceptable methodologies for remediation may include, but are not limited to the use of land drainage via interceptors.

6. Commercial End-Use where Groundwater is in soil

- 6.1 This remediation scenario is intended to refer to commercial end-use in areas where there is sufficient soil material over bedrock to commonly contain perched groundwater such that the water table is normally first encountered in soil. The area identified for commercial development in the Masterplan is the lower part of the former process area, which in general terms has these characteristics. Based on the Masterplan, no commercial developments are currently envisaged where groundwater is primarily encountered only in rock; in the event such development is proposed, Remedial Action consistent with the standards specified below would be required, adapted as necessary to local conditions.

- 6.2 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.
- 6.3 All soils must meet the RBSL for TPH to at least 1m below FFL.
- 6.4 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.
- 6.5 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.
- 6.6 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.

7. Public Open Space

- 7.1 The Developer shall remediate areas of the Property which will not be developed for residential or commercial end-uses based on those areas falling into one of the following three broad categories of land-use:
- 7.1.1 Well managed parks and public gardens;
- 7.1.2 More lightly managed areas where public access is encouraged;
- 7.1.3 Areas to which access is discouraged but occasional access and/or trespassing is possible.
- 7.2 The degree of protection that will need to be afforded to people will be largely dependent upon how the access to these areas is encouraged/discouraged and managed. For guidance only, access may be discouraged by physical barriers such as fencing, or vegetation, or actively managed by the provision of walkways along which controlled access is encouraged. The topography of the site may encourage children to use bikes, potentially causing rutting of the ground surface and exposing soils at depth. Detailed designs in this regard will be prepared by the Developer approved by CDL and agreed with the Environmental Authorities to (i) protect human health considering the reasonably anticipatable use of the land (ii) achieve the relevant RBSLs (recreational RBSLs being provided in Table 1 above) to an appropriate depth and (iii) include an appropriate scheme of validation testing.

8. Validation

- 8.1 As a minimum validation of RBSL’s will be required to include:
- 8.1.1 Determining the necessary extent of remedial excavations: this will be the responsibility of the Developer;

- 8.1.2 Quality assurance of imported materials, including testing of imported materials for contamination if it is intended to use reclaimed aggregates, top soil, etc: this will be the responsibility of the Developer, however, CDL may elect to validate such materials in-situ, once they are finally placed for construction;
- 8.1.3 Quality assurance of soils treated on the site for re-use: this will be the responsibility of the Developer, however, CDL will validate such materials in-situ, once they are finally placed for construction, and;
- 8.1.4 Quality assurance of soils for which no remedial works are identified: this will be the responsibility of the Developer, however, CDL will validate such materials.

8.2 As a minimum, sampling at the following frequencies should be undertaken.

Table 4 - 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

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 (ie aesthetic) observation

- 8.3 The quality of all material placed as fill and/or remaining in-situ post-construction of the Urban Village must as a minimum meet the relevant RBSLs and aesthetic standards at the frequencies set out above (in either case as the same may be amended in accordance with this Schedule).
- 8.4 In all circumstances, CDL and/or the Monitor may at its discretion take additional samples if it has reason to suspect that material may not meet the relevant RBSLs and

aesthetic standards (in either case as the same may be amended in accordance with this Schedule).

- 8.5 All validation samples obtained by CDL and/or the Monitor whether according to the above frequencies or on a discretionary basis must on analysis be of the same or better quality than the relevant RBSLs and meet or exceed the relevant aesthetic criteria (in either case as the same may be amended in accordance with this Schedule).

A E I C I FOR ATIO SO RCES

A E I RE ESTS FOR I FOR ATIO RFI

Contract Name:	Coed Darcy Monitor	RFI No:
Contract Number:	GNP/NJR/13773-2	Date Raised: 25 June 2015
Subject:	Review of Atkins' Validation Report for Monitor Phase 69	
To:	Michelle Lee	Atkins
Cc:	Mike Poland	Atkins
From:	Rhys Mander	AECOM

Comments

The following queries are raised in relation to Atkins' Validation Report for Monitor Phase 69 (report ref. 5041216-OSW-RPT-0001396):

- With reference to the phase boundary drawing there appears to be a discrepancy between the phase boundaries for Phases 69, 30 and 32.
- Section 1.1 – The report states that the intended use is commercial whereas the masterplan indicates that the phase shall comprise residential plots. Should the intended use change after the Monitor's RRWCC has been issued, then it should be noted that further validation and possibly further remediation work is likely to be required.
- Section 3.1 – The report states that historical exploratory holes were excavated within Phase 69 but does not discuss the extent of the historical investigation, for example how many holes were excavated and where they were.
- Section 5.1 – The report states that 517 recent exploratory trial pits have been undertaken. However, there appear to be 501 locations marked on 5041216-REM-DWG-0001974 and 530 trial pit logs in Appendix B. Please clarify.
- Section 5.2 – It is stated that pipework was encountered in 27 locations, however only 24 locations are listed in Table 5.2. The location of these occurrences is not represented on the drawings provided – this would be useful. It would also be useful to include details of the number of water strikes and seepages encountered during the recent investigations.
- Section 5.4 – It is noted that there were 3 occurrences of visual evidence of contamination with scores of 5 but there is no mention of TPE3636 which scores 5 for olfactory contamination.
- Section 5.4 – There is no mention of asbestos in this section, despite several detections in the results table in Appendix C.
- Section 6.1 – With reference to the exploratory hole location plan presented in Drawing 5041216-REM-DWG-0001974, there appears to be a number of areas within the phase that have not been fully investigated. It is noted in Section 6.1 that further investigation is proposed, for example within the footprint of the stockpiles. It will be necessary to complete these works and achieve full coverage of the phase before the RRWCC can be issued.
- It is noted that further remediation works are required in order to satisfy the requirements of the Section 106 Agreement. It should be noted that the RRWCC will only be issued once these works have been completed and appropriately validated.
- The finalised validation report will need to include a topographical record of the ground profile pre-investigation, at the base of the remediation excavation and the finished ground profile.

Date: 25 June 2015

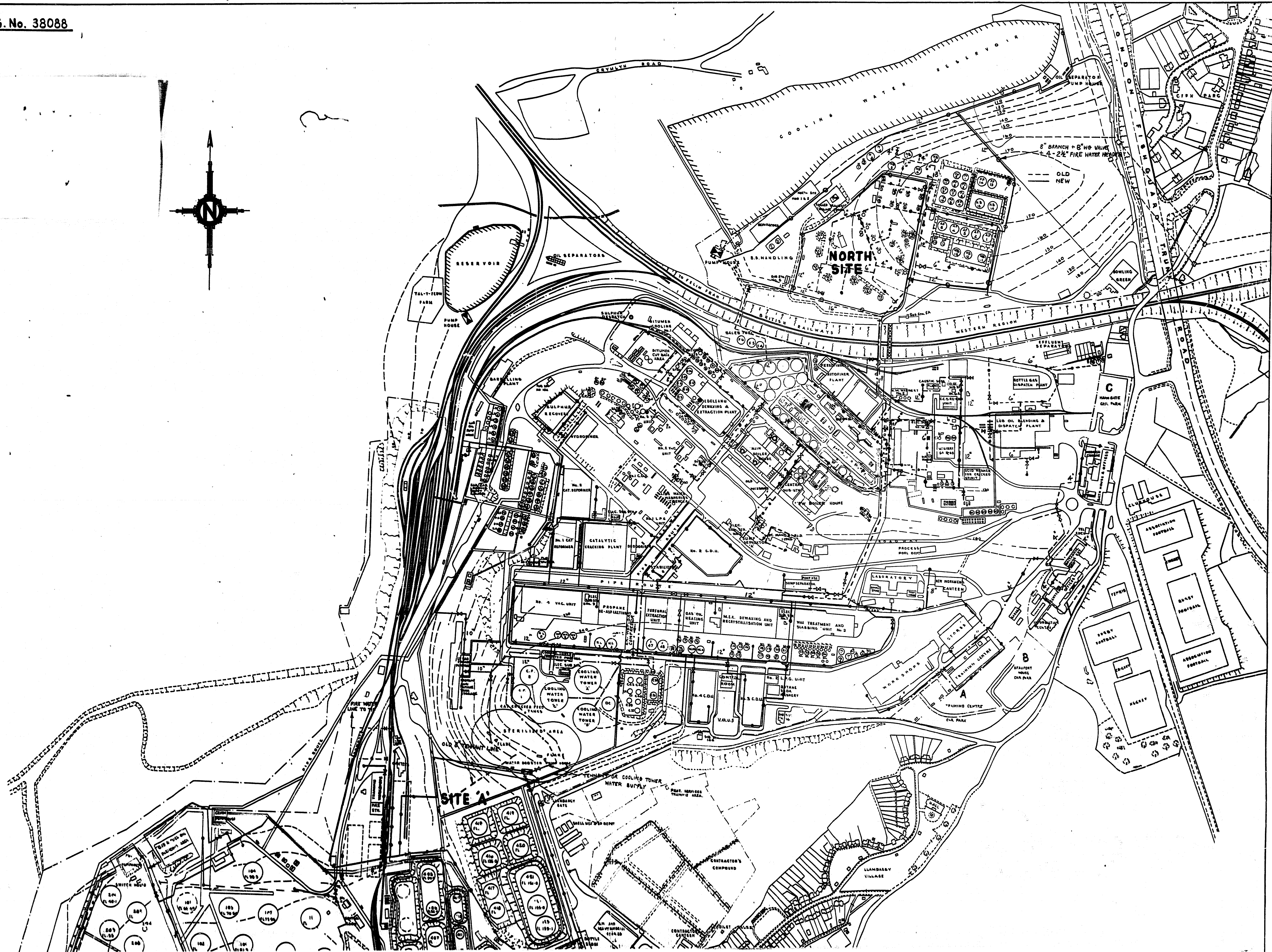
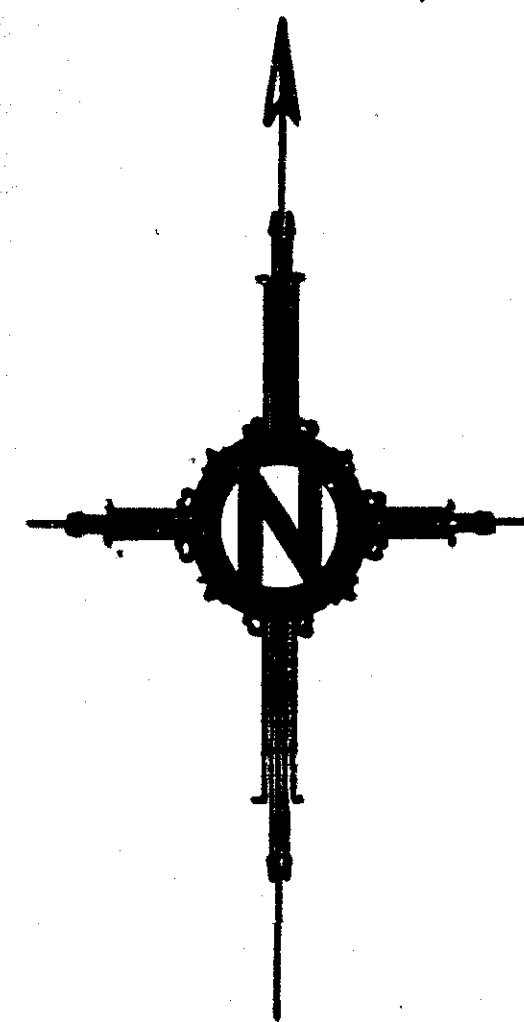
A E I E HISTORICAL A S

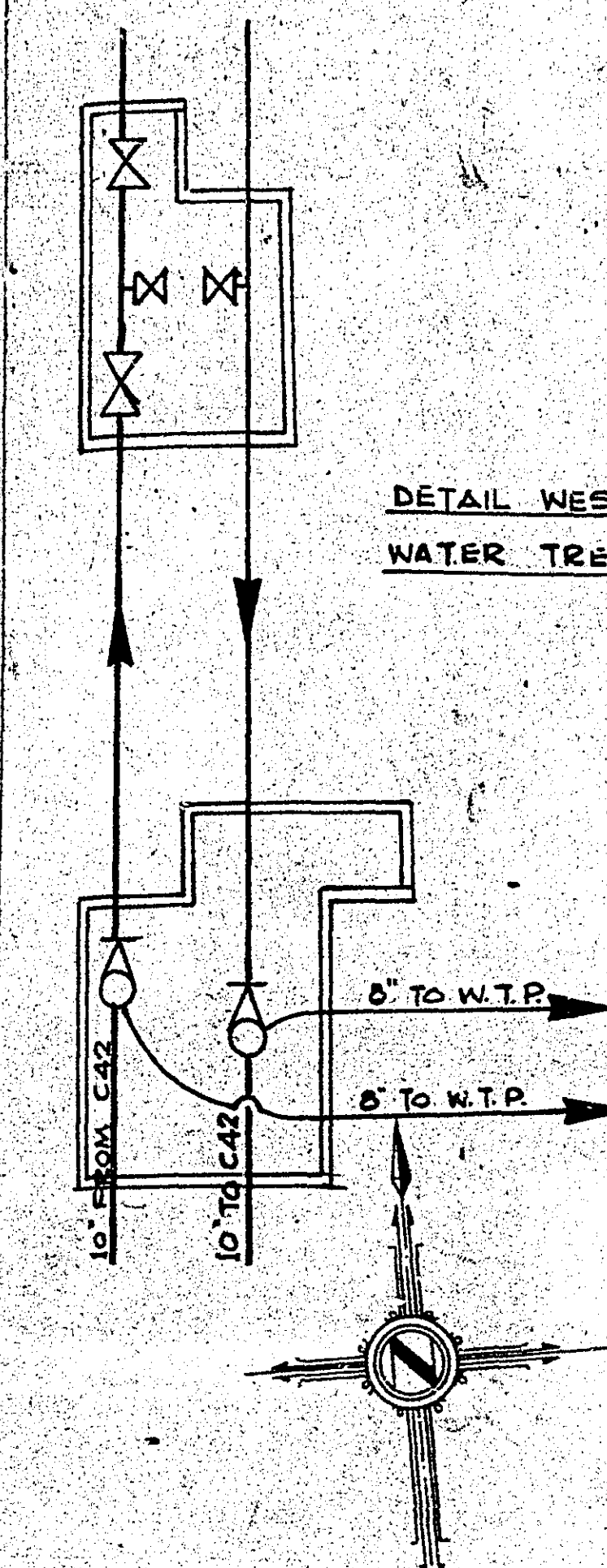


ISSUE 1
~~DELLETT~~ - MEROX UNIT; POWER STM. N° 2; SUMP SEPARATORS A & B
 COOLING TOWERS A, B & C; 118, OIL BLENDING DESPATCH PLANT;
 BOTTLED GAS DESPATCH PLANT;
 THANKS: 105, 106, 107, 110, 111, 113, 114 115; 227 TO 233 INC.;
 301 TO 318 INC.; 400 TO 412 INC. 415 TO 430 INC, 433, 434, 437, 438,
 102, 108, 109, 210, 216.
~~HEAD~~ - WALKER GAS STATION; VDU PREHEAT & COOLING TOWER;
 WHITE OIL, SLURRY ROAD LOADING GRANTLEY; WHITE OIL & LPG
 RIG LOADING GRANTLEY; THANK D.M.I. THANKS B3,D4,D6,D7,D10,
 E9, E10, KERRY PARK.

ADDED - WALES GAS STATION; VDU PREHEAT & COOLING TOWER;
WHITE OIL SLACK WAX ROAD LOADING GANTRY; WHITE OIL & LRG.
RAIL LOADING GANTRIES; TANK DWA.1, TANKS D3,D4,D6,D7,D10,
E9,E10, LORRY PARK.

[illegible]





DETAIL WEST OF WATER TREATMENT PLANT

18" CRUDE OIL LINE

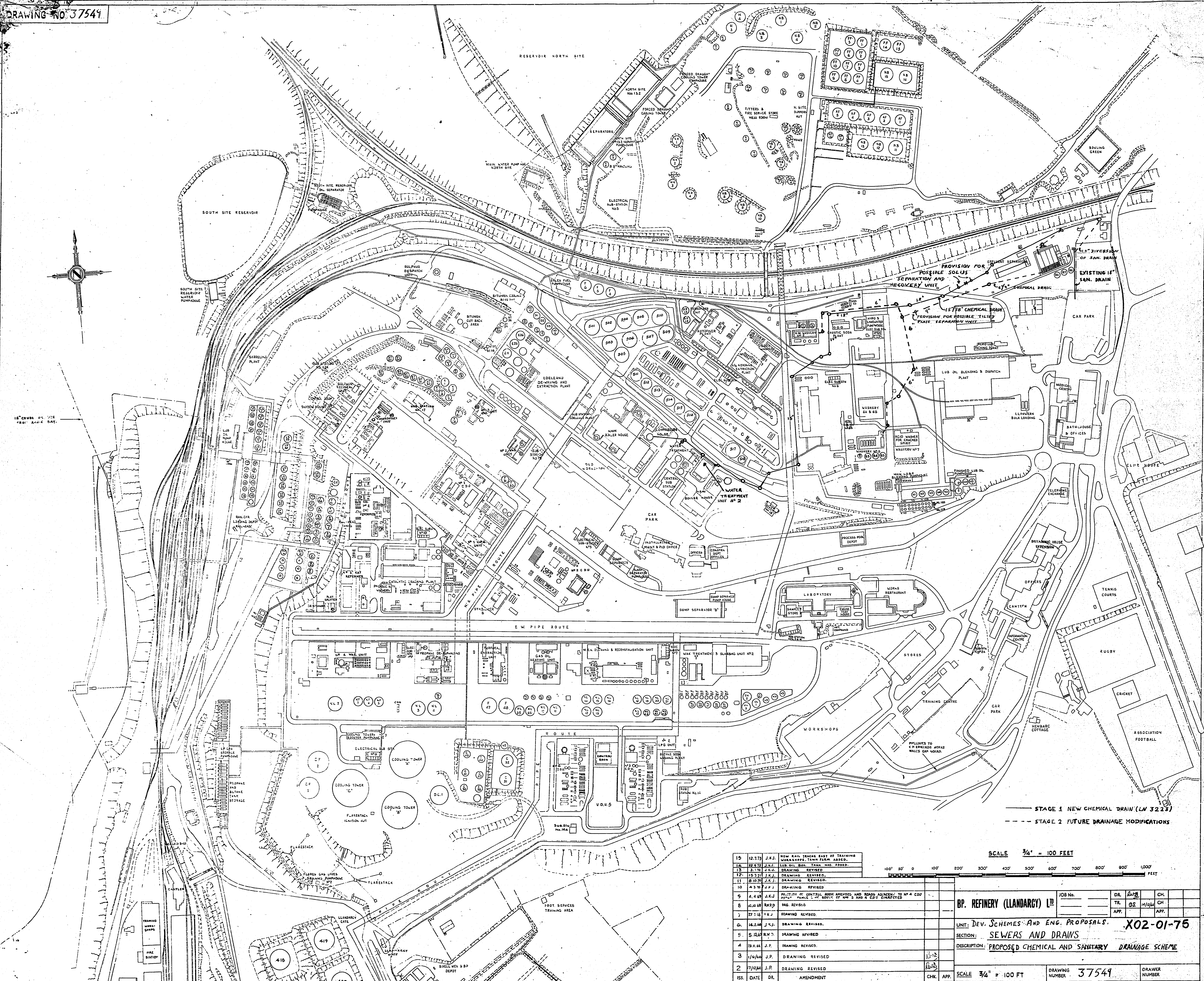
TO CATTLE TROUGH

NOT FOR PUBLICATION

SCALE $\frac{3}{4}" = 100$ FEET

15	3-7-73	J.K.J.	NEW R&H TRACKS EAST OF TRAINING WATERPITS. TRAIL P&M. ADDD.
14	22-9-72	J.K.V.	LUB OIL BOWL TANK MOD. ADDD.
13	3-6-72	J.K.V.	DRAWING REVISED
12	12-7-71	J.K.J.	DRAWING REVISED.
11	9-10-70	J.K.J.	DRAWING REVISED.
10	4-3-70	J.Y.I.	DRAWING REVISED.
9	4-6-69	J.K.J.	POSITION OF CONTROL ROOM AMENDED AS AHEAD FROM LINE SOUTH OF HWY. 3.
8	10-10-68	WARD	ORG. REVISED.
7	21-7-68	J.K.J.	DRAWING REVISED
6	14-2-68	J.K.J.	DRAWING REVISED.
5	8-12-65	R.W.D.	DRAWING REVISED
4	23-8-66	J.P.	DRAWING REVISED.
3	1/6/66	J.P.	DRAWING REVISED
2	7/12/64	J.P.	DRAWING REVISED
ISS.	DATE	DR.	AMENDMENT

BP. REFINERY (LLANDARCY) [TD	JOB No.	D.R.	H.M.T.	CH.
		TR.	OS	4/2/54
		APP.		APP.
UNIT: ESTATE				
SECTION: PLOT PLANS & LAYOUTS				
DESCRIPTION: LAYOUT OF REFINERY NEATH WATER				
SCALE 1/4" = 100 FT	DRAWING NUMBER 02-01-133			DRAWER NUMBER



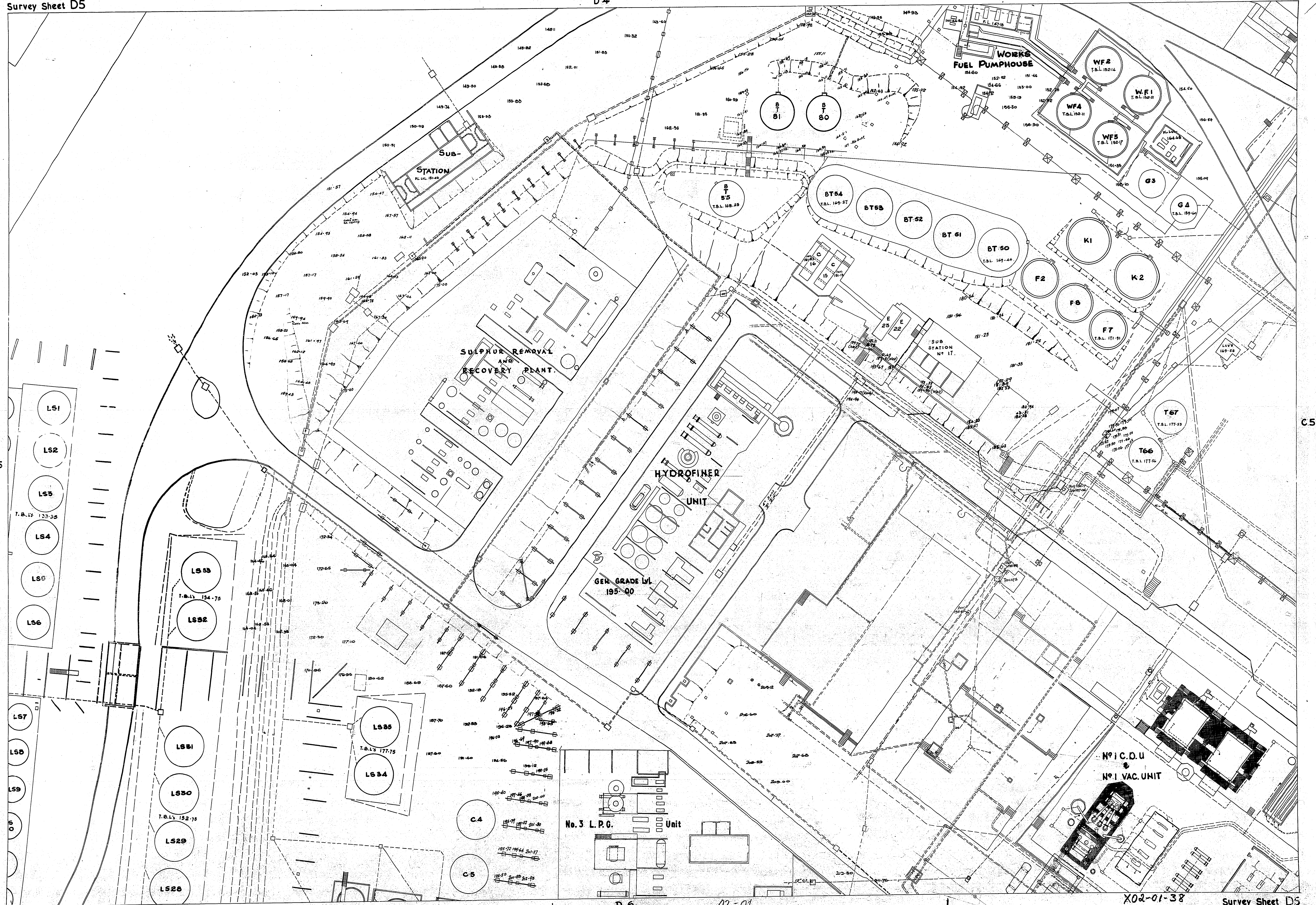
— STAGE 1 NEW CHEMICAL DRAIN (LN 3223)
 - - - STAGE 2 FUTURE DRAINAGE MODIFICATIONS

SCALE 3/4" = 100 FEET

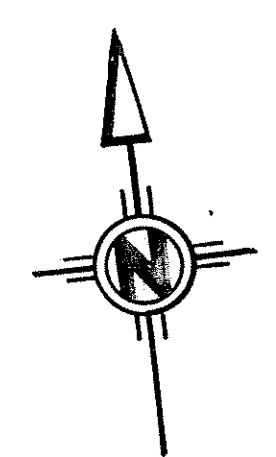
15	12.7.73	J.K.J.	NEW RAIL TRACKS EAST OF TRAINING WORKSHOPS, TANK FARM, ADDED.
14	22.9.72	J.K.J.	LUB OIL BKG. TANK HAS ADDED.
13	3.1.72	J.K.J.	DRAWING REVISED.
12	10.7.71	J.K.J.	DRAWING REVISED.
11	8.10.70	J.K.J.	DRAWING REVISED.
10	4.3.70	J.K.J.	DRAWING REVISED.
9	4.4.69	J.K.J.	POSITION OF CONTROL ROOM AMPLIFIED AND ROADS ADJACENT TO NO. 4 CDU ADDED. FENCE L. OF ROAD OF NO. 3 AND 4 CDUs CHANGED.
8	6.10.68	R.M.D.	DWG. REVISED.
7	27.1.68	J.K.J.	DRAWING REVISED.
6	16.2.66	J.K.J.	DRAWING REVISED.
5	5.12.65	R.M.D.	DRAWING REVISED.
4	23.8.64	J.P.	DRAWING REVISED.
3	1/6/64	J.P.	DRAWING REVISED.
2	7/12/64	J.P.	DRAWING REVISED.
155	DATE	DR.	AMENDMENT

BP. REFINERY (LLANDARCY) LTD. JOB No.
 UNIT: DEV. SCHEMES AND ENG. PROPOSALS. X02-01-75
 SECTION: SEWERS AND DRAINS
 DESCRIPTION: PROPOSED CHEMICAL AND SANITARY DRAINAGE SCHEME

SCALE 3/4" = 100 FT. DRAWING NUMBER 37549. DRAWER NUMBER



REV	DATE	AMENDMENTS
1	15/10/89	LEVELS UPDATED TO HIGHWAY
2	16/11/89	GENERAL UPDATE



CONT'D. ON DRS. NO. 92-01-173-B5

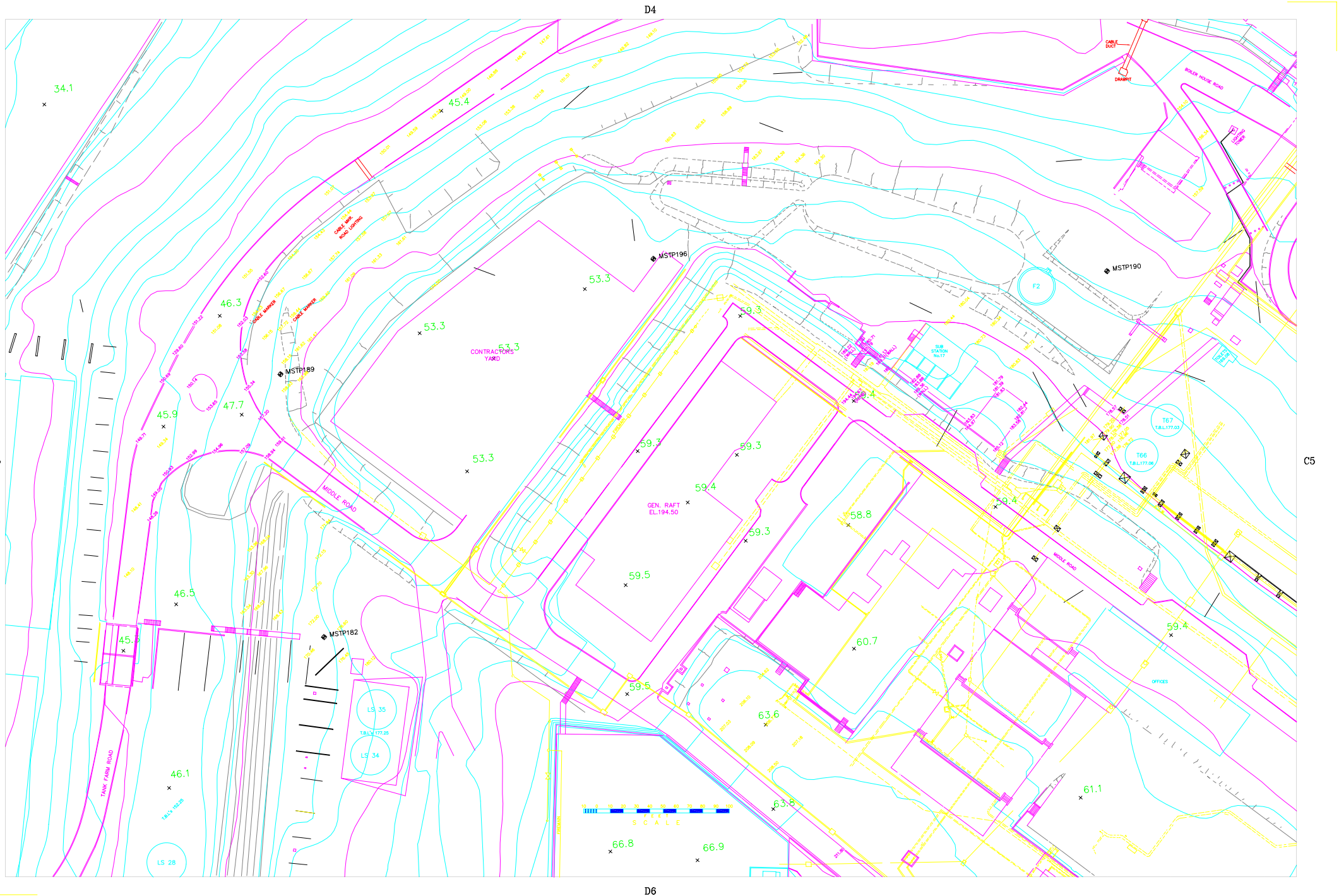
PLAN DETAIL
2, DRG. NO. 92-01-173-B

PLAN DETAIL
3, DRG. NO. 92-01-173-B

THIS DRG. NO. 92-01-179

CONT'D. ON DRG. NO. 92-01-178 - D6

REVISED		DRG. "AS ON SITE"		CHK'D / APP'D.	
ISSUE	DATE	DRAWN	PURPOSE OF ISSUE		
B P OIL, LLANDARCY REFINERY LTD.					
TITLE	PIPING SURVEY				
LOCATION	TANK FARM / RAILHEAD				
SUBJECT	PIPING INSPECTION				
DESCRIPTION	LAYOUT OF PIPELINES IN AREA D5				
SCALE	1"=25'-0"		DRAWING NUMBER	92-01-179	
			X02-01-38		



*A E I F TO O RA ICAL
RECOR OF T E RO
LE ELS FOLLO I T E
CO LETIO OF T E
RE E ELO E T
RE E IATIO OR S*