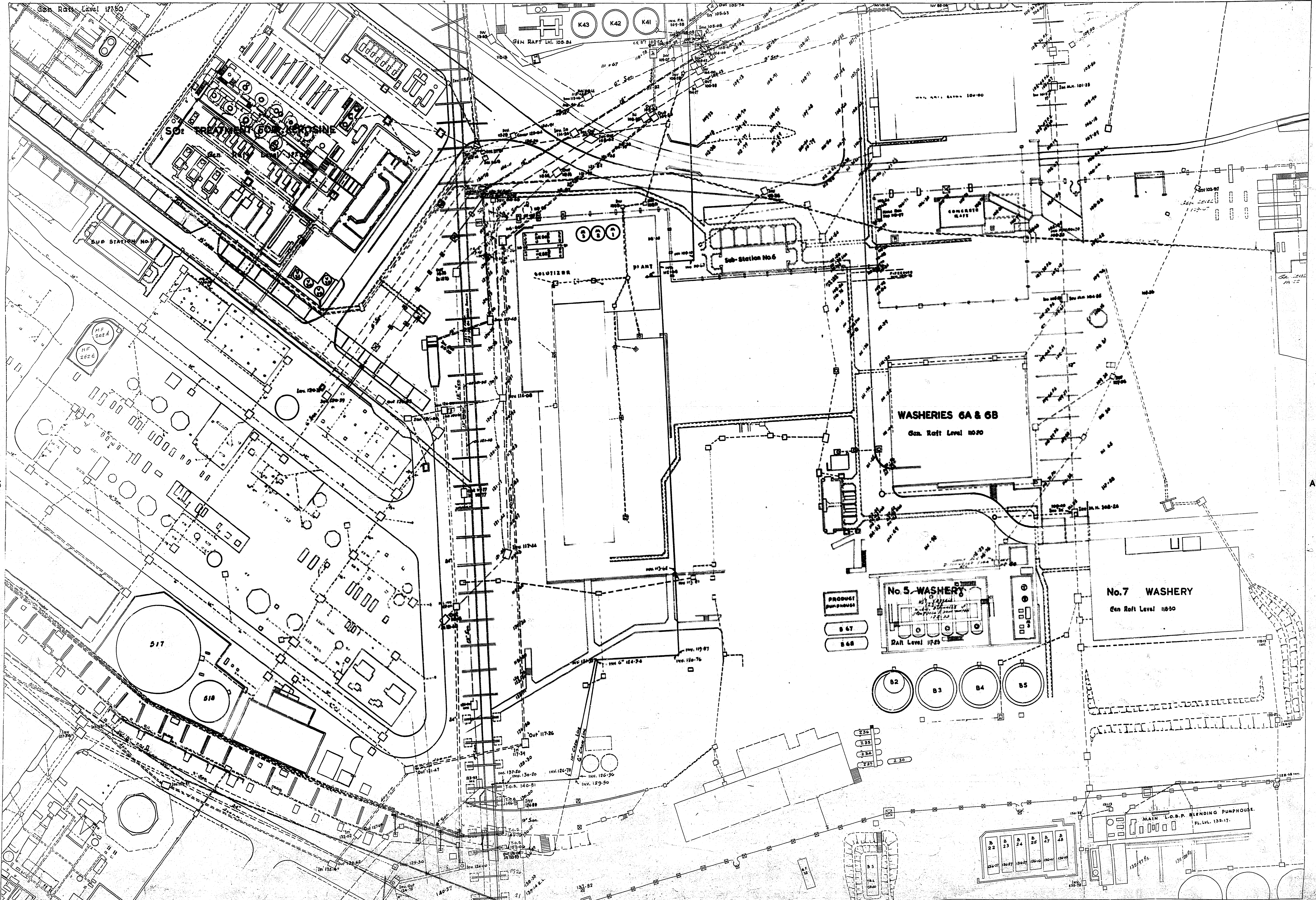
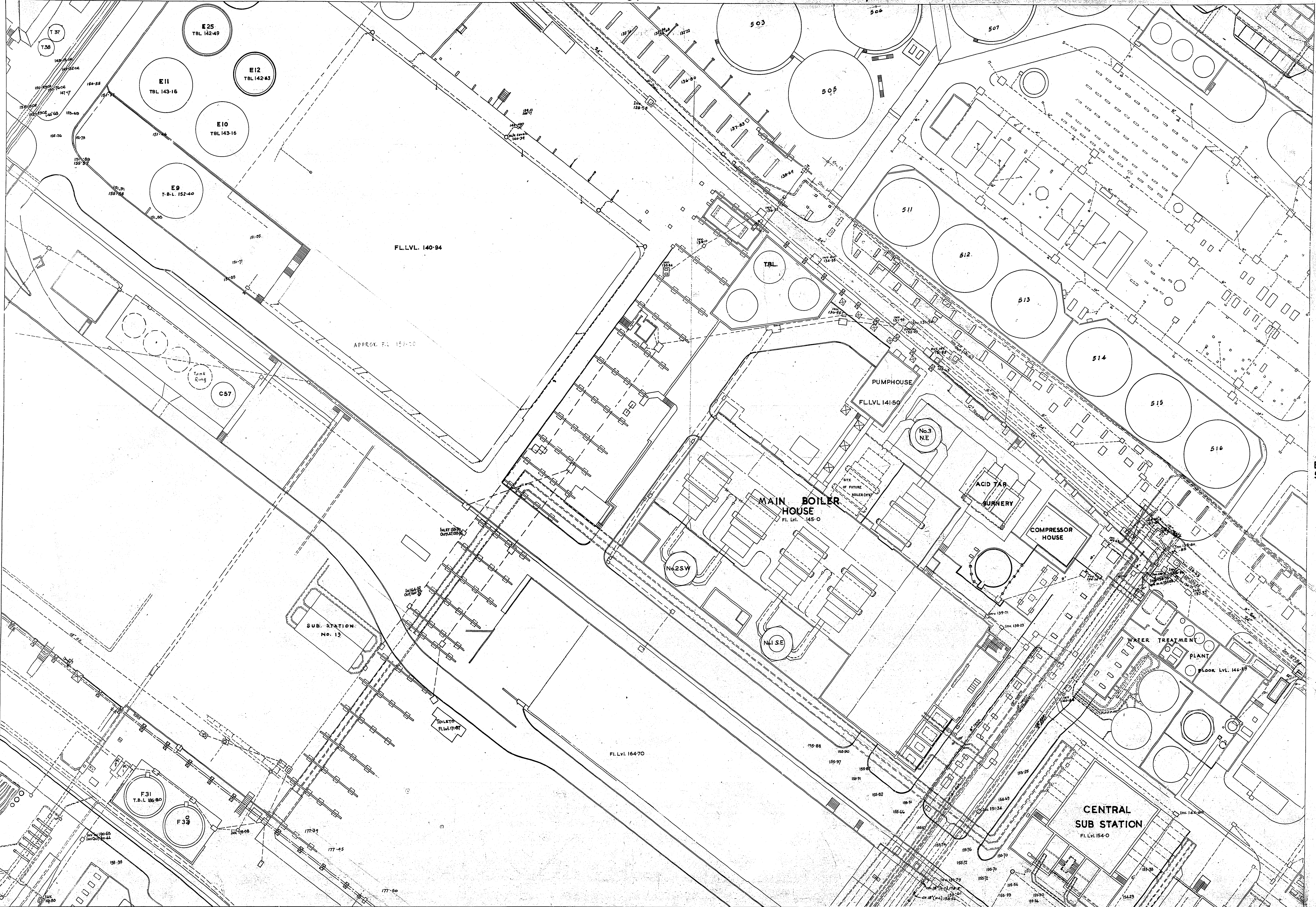


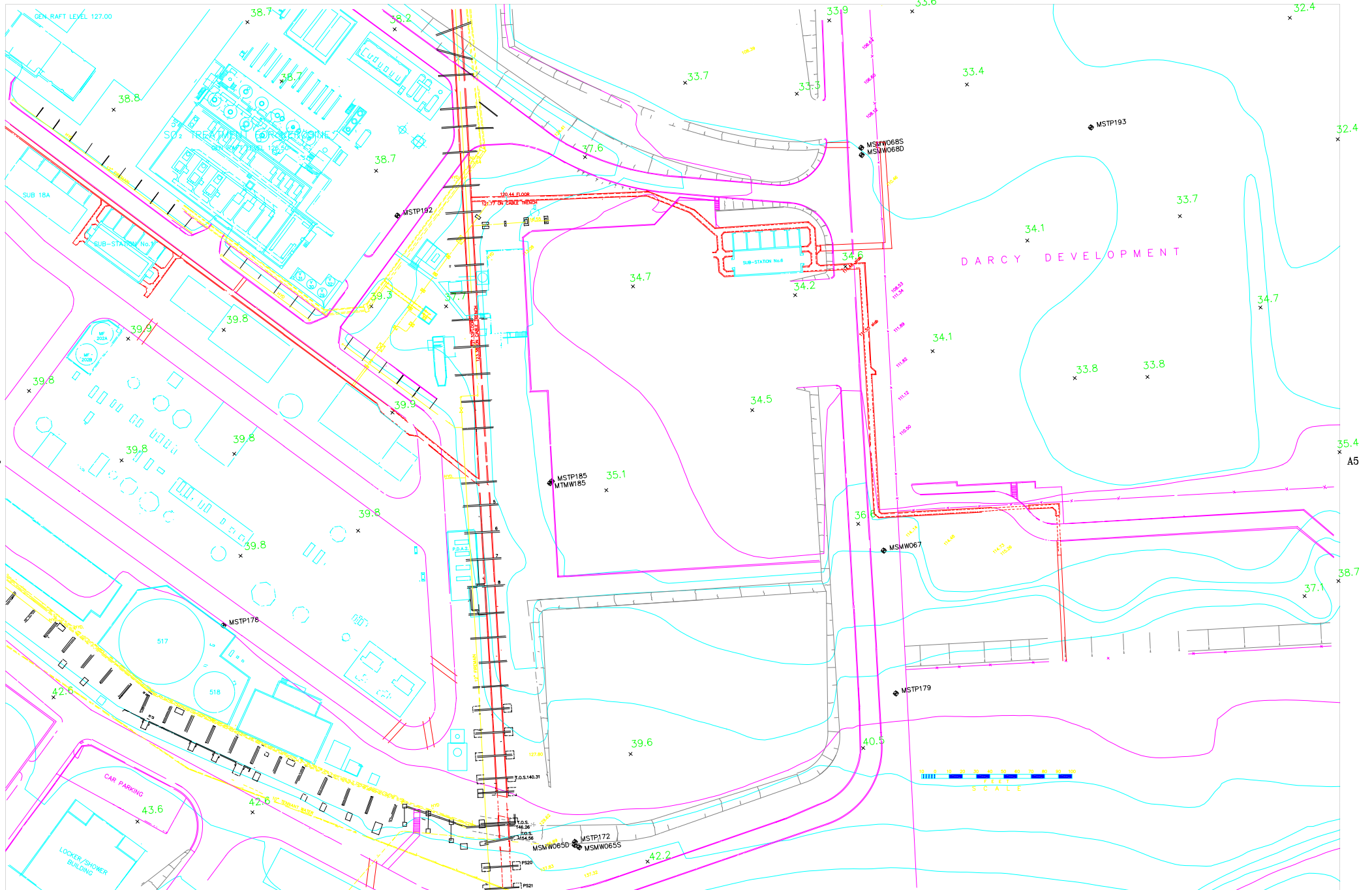


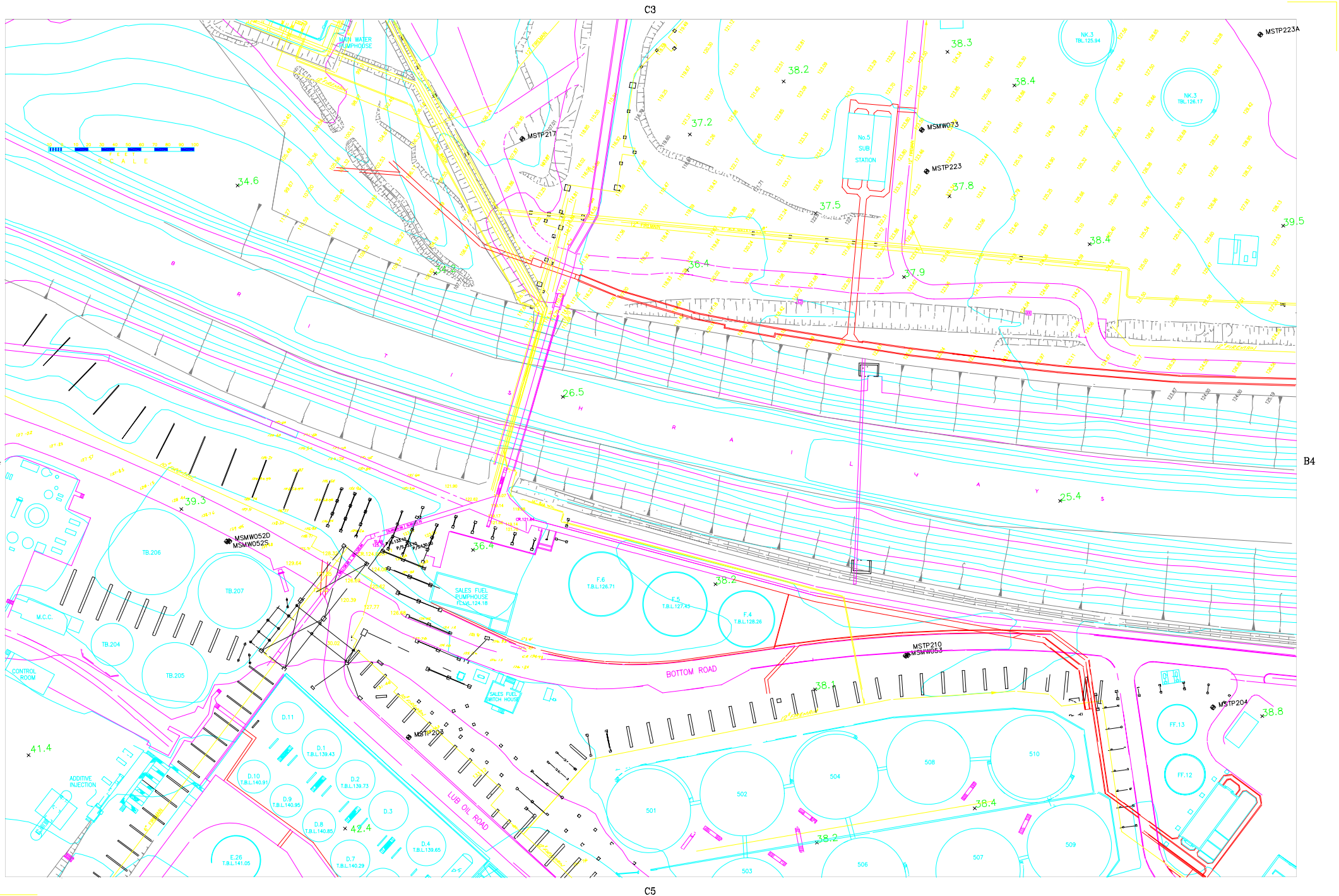




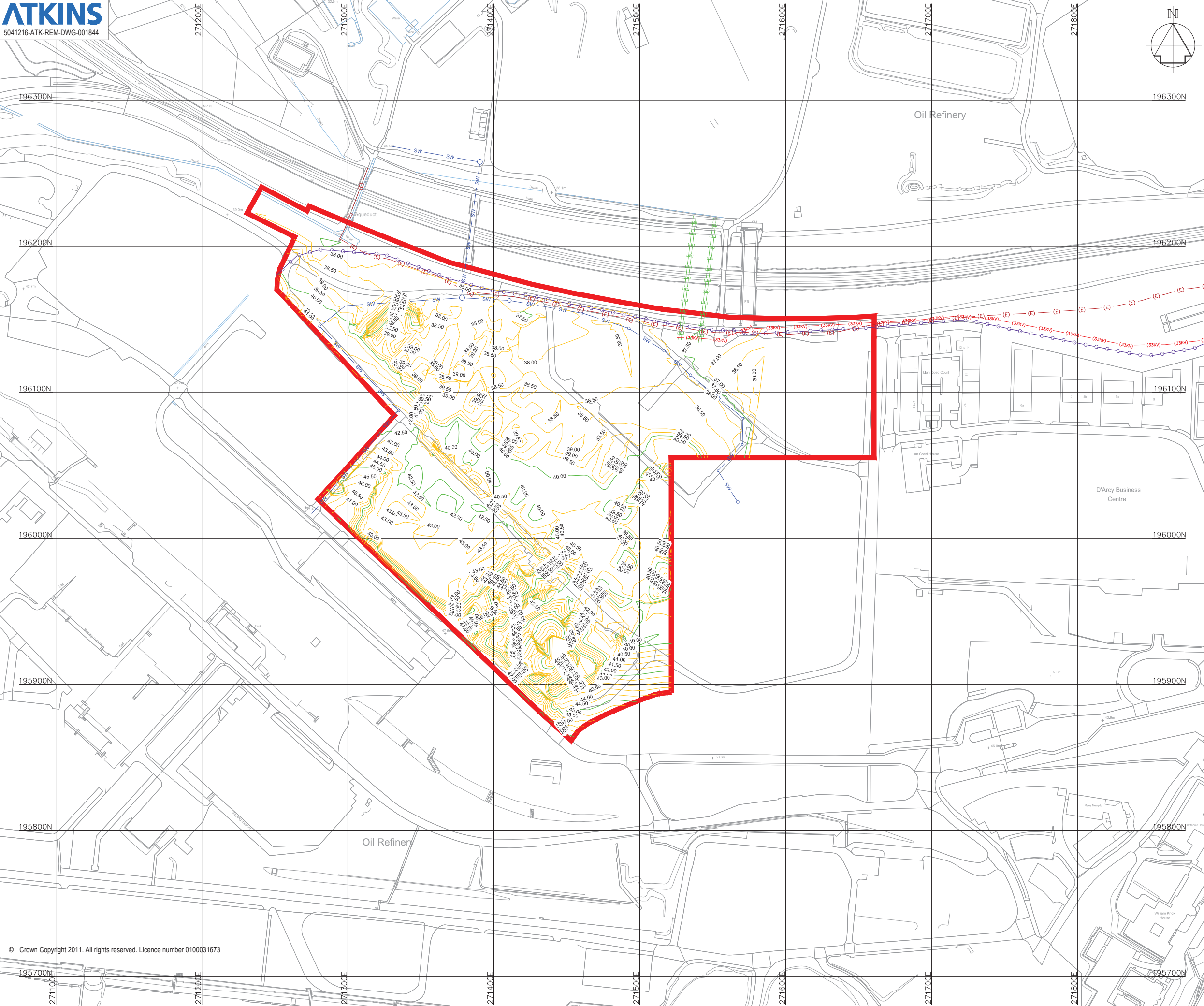
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NOTE

1. THIS DRAWING WAS BASED ON SURVEY INFORMATION PRODUCED AND PROVIDED BY HAWK 2015.
2. AS BUILT LEVELS AS OF MARCH 2015. PRIOR TO CONSTRUCTION OF THE EMBANKMENT AND UPFILLING WORKS.

KEY:

- PRE REMEDIATION CONTOURS
- DIME AREA PHASE BOUNDARY
- SURFACE WATER DRAINAGE
- LOW VOLTAGE UNDERGROUND CABLE
- 33kV UNDERGROUND CABLE
- LOW VOLTAGE OVERHEAD CABLE
- GAS MAIN

REVISIONS	Drawn By	Checked By	Date
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CLIENT

ST.MODWEN

PROJECT

COED DARCY

DRAWING TITLE
MONITOR PHASE 38 POST REMEDIATION GROUND LEVELS

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1:1250	MJ	AM	ML
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DRAWING NO	SHEET	PLOT DATE	REV
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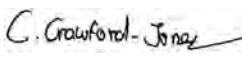
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Coed Darcy Monitor Phase 48 RRWCC

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TABLE OF CONTENTS

1.	INTRODUCTION.....	1
1.1	Scope	1
1.2	Background	2
1.2.1	Objectives of the Redevelopment Remediation Works	2
1.2.2	Remediation Action Plan (RAP) Works.....	7
1.3	Information Sources	7
1.4	Requests for Information (RFIs) Issued by the Monitor	8
2.	DESCRIPTION OF THE REMEDIAL ACTION	9
2.1	Site Assessment	9
2.1.1	Desk Study	9
2.1.2	Intrusive Investigations.....	10
2.2	Remediation Strategy.....	11
2.3	Redevelopment Remediation Works	12
2.4	Validation	12
2.4.1	Aesthetic Criteria and the Removal of Oil Saturated Soils.....	13
2.4.2	Soil Chemical Quality and Testing Frequencies	13
2.4.3	Groundwater Quality	14
2.4.4	Measures to Prevent Contamination Migration.....	14
2.4.5	Asbestos	14
2.4.6	Removal of Buried Services.....	15
2.4.7	Recontamination of Soils	15
2.4.8	Fill to Achieve FFL	15
3.	CERTIFICATION.....	16
3.1	Redevelopment Remediation Works	16
3.2	Preventative Measures	18
3.2.1	Ground Gas.....	18
4.	CONCLUSIONS.....	18
4.1	RRWCC.....	18
4.2	PWCD	18
APPENDIX A	DECLARATION OF PHASE BOUNDARY, INTENDED USE AND PROPOSED DEVELOPMENT LAYOUT	
APPENDIX B	SCHEDULE 8 OF THE SECTION 106 AGREEMENT	
APPENDIX C	INFORMATION SOURCES	
APPENDIX D	REQUESTS FOR INFORMATION (RFI)	
APPENDIX E	HISTORICAL MAPS	
APPENDIX F	TOPOGRAPHICAL RECORD OF THE GROUND LEVELS FOLLOWING THE COMPLETION OF THE REDEVELOPMENT REMEDIATION WORKS	
APPENDIX G	COMPARISON OF RBSL AND RTC THRESHOLDS	

**TABLE OF
FIGURES**

FIGURE 1 – LOCATION PLAN 1

**TABLE OF
TABLES**

TABLE 1 SUMMARY OF SOIL RBSLS..... 3

TABLE 2 SUMMARY OF RBSLS FOR GROUNDWATER 5

TABLE 3 SCALE OF AESTHETIC CRITERIA 6

TABLE 4 MINIMUM VALIDATION TESTING FREQUENCIES..... 6

TABLE 5 INFORMATION SOURCES 8

TABLE 6 RFIS 9

TABLE 7 CERTIFICATE SUMMARY 16

1. INTRODUCTION

1.1 Scope

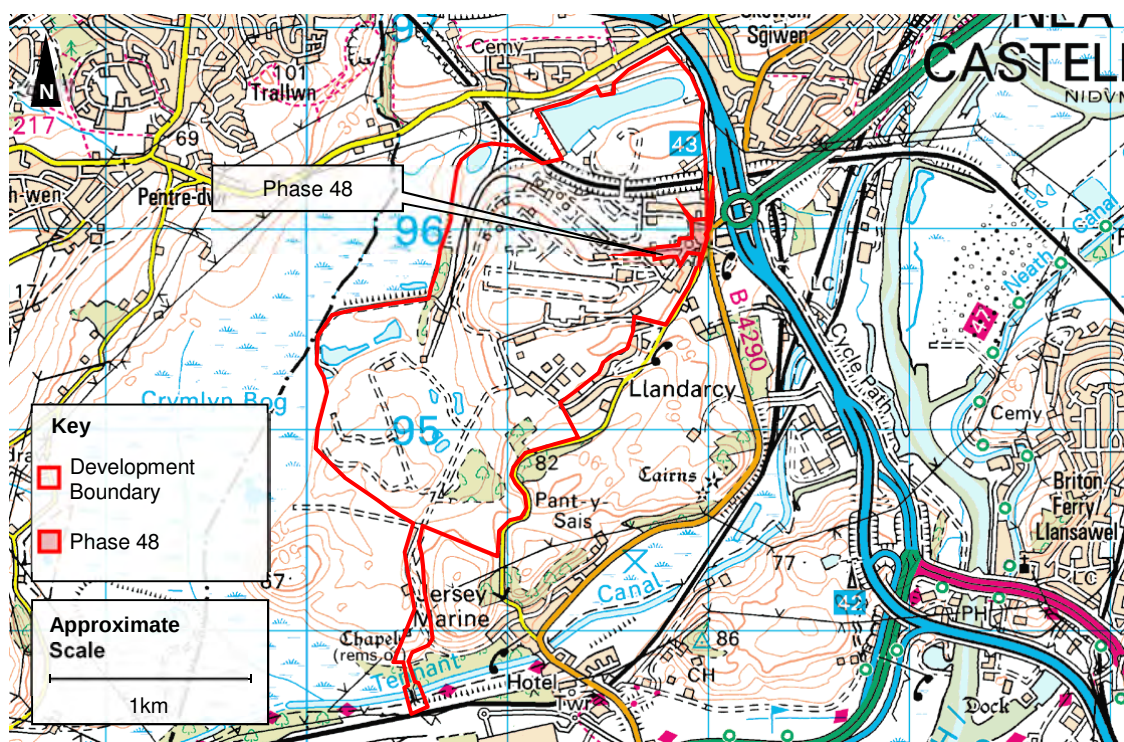
This Redevelopment Remediation Works Completion Certificate (RRWCC) has been prepared with reference to the following agreements:

- 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 48 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 **Appendix A**.

The intended use for Phase 48 has been declared as commercial. The phase boundary for Phase 48 is the land edged red on drawing 5041216-ATK-DR-C-REM-2149 Rev P1, a copy of which is provided in **Appendix A**. The approximate location of Phase 48 in relation to the Development Boundary is shown in **Figure 1** below. Phase 48 covers an area of approximately 32,000m².



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Figure 1 – Location plan

Phase 48 comprises the northern access into the Coed Darcy site and will predominately consist of highways and grass verges as illustrated on Atkins' general arrangement drawing

5041216/J43A/363 Rev D, a copy of which is provided in **Appendix A**. At the time of writing, construction of the northern access is substantially complete.

A copy of the current masterplan drawing reference 1332/400/MP/SK/TERT Revision H, which illustrates the wider development proposals, is also provided in **Appendix A**.

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 48; and
- Certify whether or not in the Monitor's professional opinion the redevelopment remediation works have been satisfactorily completed for Phase 48 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**.

1.2 Background

1.2.1 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 remedial 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 1 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
Dichloromethane	5	1650	241	84	665	6220
Tetrachloroethene	11	1050	641	34	368	1780

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
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	-	-

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 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

Land-Use Specific RBSL (mg/l)

Contaminant	Residential	Commercial	Recreational
1,1,1-Trichloroethane	193	989	none

Notes

“none” theoretical RBSL greater than solubility limit

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 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 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 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

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)
>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

1.2.2 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/BRRP00065/Cert 48a.

1.3 Information Sources

A summary of the information sources that the Monitor has been provided with in relation to Phase 48 is provided below in **Table 5**. 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 5 Information Sources

<i>Ref.</i>	<i>Document Reference</i>	<i>Format</i>	<i>Title</i>	<i>Author</i>	<i>Date</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/J43A/316 Rev A	Drawing	Junction 43 Improvements and Site Access Road General Arrangement	Atkins	April 2009
4	111205JD	Technical Note	Coed Darcy J43 Improvements & Site Access Ground Investigation	Atkins	November 2011
5	5041216/REM/RPT/375	Report	Coed Darcy Commercial Area, Controlled Waters Risk Assessment	Atkins	March 2012
6	504126/REM/RPT/126	Report	Coed Darcy Urban Village, Northern Access Road Geo-environmental summary and outline remediation strategy	Atkins	April 2012
7	504126/PLOTS/RPT/1016	Report	Coed Darcy Urban Village, Commercial Area Validation Report	Atkins	September 2014
8	5041216-OSW-RPT- 0001361	Report	St Modwen Homes (Northern Access Road (NAR)) Validation Report	Atkins	April 2015
9	5041216-OSW-RPT- 0001398	Report	Validation Report Monitor NAR Phase 48 Revision 2	Atkins	January 2016
10	5041216-OSW-TN- 0001546	Technical Note	Phase 48 Response to Monitor RFI 0152	Atkins	January 2016
11	5041216-REM-TN-1557	Technical Note	Soil sampling within landscaped areas in Monitor Phase 48	Atkins	February 2016

1.4

Requests for Information (RFIs) Issued by the Monitor

The Monitor has raised one RFI in relation to Phase 48, as summarised in **Table 6** 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 6 RFIs

<i>RFI Ref.</i>	<i>Title</i>	<i>Associated Atkins Document</i>	<i>Date Raised</i>	<i>Complete</i>	<i>Comments</i>
152	Review of Atkins' Validation Report for Monitor Phase 48	Atkins Validation Report for Monitor Phase 48 ref. 5041216-OSW-RPT-0001546	January 2016	Yes	Response to RFI and updated validation report received

2. 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 48. This section of the report is structured as follows:

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

2.1 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.

2.1.1 Desk Study

It can be seen from the list of information sources provided in **Table 5** that Atkins has prepared a number of reports and technical notes examining the Northern Access Road. It is evident that Atkins has reviewed the information collected during previous site investigations and desk studies to develop an understanding of both potential and actual contamination. The following is of note.

Phase 48 is located within the north-eastern part of the central processing area of the former refinery. With reference to the historical maps provided in **Appendix E** it can be seen that various refinery infrastructure was situated within and around Phase 48 as follows:

- Lube oil blending and packaging plant;
- Lube oil storage tanks and associated pipework;
- The Bath House and a number of small buildings used as offices and a medical centre;
- The Kerswell Building (a small brick building used as the telephone exchange for the former oil refinery) in the southern part of the site;
- Pumphouse and associated tanks; and

- An acid washer in the west of the site area.

The M4 motorway is also located directly adjacent to the north east of Phase 48.

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 Drift (undifferentiated) overlying Carboniferous, Upper Pennant Measures. The solid strata are shown to dip to the north-north-west.

With regards hydrogeology, Atkins reports that the closest surface water features to the Phase 48 are a series of drains associated with Junction 43 of the M4 motorway. The River Neath is situated approximately 830m east of the site. 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 a strategic scale, and in some cases forming an important source of base flows to rivers'.

Groundwater within Phase 48 is generally situated within the underlying bedrock and flow is considered to be towards the north/north east. This is consistent with the general topography of this area.

2.1.2 Intrusive Investigations

URS carried out a number of historical 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 five exploratory holes within Phase 48.

Between 2008 and 2011 Atkins also undertook site investigations which included the excavation of further 40 trial pits, 11 dynamic probe holes and eight boreholes within the central and north-eastern parts of Phase 48. The site investigation was carried out after the removal of historical structures within this area, however, it is understood that the basement slab of the Bath House remains in situ. Details of these site investigations are presented in Atkins' validation report (Information Source 9). A summary of the site investigations is provided below:

- 2008 – A series of machine excavated trial pits associated with the potential new access road;
- 2010 – Three machine excavated trial pits within the area of the former bathhouse and hand-dug trial pits to located recorded services;
- 2011 – A series of machine excavated trial pits associated with the assessment of the proposed commercial area; and
- 2011 – A combination of window sampler, cable percussive/rotary boreholes and machine excavated trial pits associated with the design of the new highway.

Logs from the trial pits and boreholes 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. The bedrock was generally shallow across the southern part of the site from 0.6m below ground level (bgl) at some locations, but dropped to approximately 4.5m bgl towards the north of the Phase 48.

Land contamination is reported to have been evident within the soils historically during URS' site investigation in the form of staining and odours. However, Atkins did not report visual or olfactory evidence of contamination during their more recent site investigations. Laboratory analysis identified lead in excess of the adopted thresholds for commercial end use in four locations within the northern section of Phase 48. Asbestos was not encountered during Atkins' site investigations.

Perched groundwater was encountered within the Made Ground and natural deposits across Phase 48, although as discussed above true groundwater is considered to lie within the underlying bedrock.

2.2 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 48 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 48:

- 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.

2.3 Redevelopment Remediation Works

The works that have been completed within Phase 48 are described in Atkins' validation report (Information Source 9) and can be summarised as follows:

- Demolition and removal of the above ground structures including the Bath House and Kerswell Building in 2009;
- Removal of an access road for the Environment Agency building in 2011, followed by a validation walkover by Atkins;
- Landscaping of the former Bath House area;
- Construction of an embankment as part of Road 1 in 2011;
- Realignment of site access road and B4290 in 2012;
- Removal of below ground structural remnants in the north-western portion of Phase 48 in January 2012 to March 2012;
- Re-profiling of the ground to allow targeted site investigations in March 2012; and
- Removal of one asbestos hotspot.

It is noted that in terms of land remediation, the approach adopted by Atkins generally involved a watching brief during the demolition of the former buildings and construction of the new highway. Atkins reports that other than one asbestos hotspot, which was subsequently removed, no significant contamination was encountered and therefore no remediation works were considered necessary.

2.4 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.

2.4.1 *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 3** of this report. Soils achieving an aesthetic classification of 5 (visible hydrocarbon product and/or overwhelming odour) would be deemed to comprise oil saturated soils and/or soil containing free product and would therefore be considered unsuitable for retention.

Atkins reports that the majority of visual/olfactory classifications recorded during the site investigation were below 2 and the highest was 4, associated with localised areas of increased staining or odours in the vicinity of trial pits AR4, TPE1 and CATP002.

Atkins reports that a review of available monitoring data for the monitoring wells within Phase 48 suggests the presence of free product 1mm thick in P1BH006 and P1BH007 on a single occasion in 2003. However, Atkins states that no free product was recorded during the subsequent site investigations.

Given these observations, the soils were considered to be suitable for retention based on the specified aesthetic criteria. The trial pit logs provided in Atkins' validation report (Information Source 9) appear to confirm the absence of oil saturated soils and soil containing free product within Phase 48.

In summary, the Monitor is satisfied that oil saturated soils and soil containing free product do not appear to be present within Phase 48.

2.4.2 *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 G**.

Atkins reports that 66 soil samples were recovered from Phase 48. Laboratory testing identified four exceedances against the RBSL/RTC thresholds, all of which were for lead, and all located within the northeast of Phase 48. Atkins reports that this area is situated beneath a grass verge surrounded by busy roads and it is envisaged that members of the public would only walk across this area, so there is not considered to be a plausible means of exposure. The Monitor is satisfied that given the location, the lead exceedances do not pose a significant human health risk.

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 4** in this report. With reference to that table, the testing frequency for in situ soils for a commercial end use is a minimum of 1 per 400m², irrespective of the depth below FFL.

Given that 66 soil samples were taken across Phase 48, the area of which is approximately 32,000m², a testing frequency of 1 per 485m² has been achieved, which does not comply with the minimum testing frequency specified in the Section 106 Agreement of 1 per 400m². However, Atkins considers this discrepancy to be insignificant given the chemical quality of the soil samples which were generally acceptable. Furthermore a watching brief was undertaken during the demolition works and subsequent construction of the access roads and Atkins reports that there were no visual or olfactory indications of contamination.

Despite the reduced testing frequency, and notwithstanding the lead exceedances discussed above, the Monitor is satisfied that the soils within Phase 48 appear to meet the necessary chemical quality requirements specified in the Section 106 Agreement.

2.4.3 Groundwater Quality

In addition to the RBSLs for soils, the Section 106 Agreement also specifies RBSLs for groundwater as detailed in **Table 2** 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 reports no evidence of seepages, sheens or free product during the works and does not consider there to be any such matters that require control to prevent discharge at ground surface. Furthermore, given the depth of groundwater in relation to the FFL, it is considered unlikely that any such seepages, if present, would discharge at surface.

The Monitor is satisfied that groundwater quality is unlikely to have a detrimental impact on Phase 48 and no further control measures are considered necessary in relation to the management of seeps, sheens and iron rich discharges.

2.4.4 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 48 is likely to be towards the north/northeast following the general topography of the ground in the area. Given the absence of free product and oil saturated soils within Phase 48, the recontamination of down gradient areas is considered unlikely. Therefore measures to prevent the migration of contamination are not considered necessary for Phase 48.

In summary the Monitor is satisfied that there is minimal risk of migration in ground of hazardous gas or contaminated liquid into or out of Phase 48 and therefore no measures are considered necessary to prevent the recontamination of soils.

2.4.5 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.

Atkins reports that a total of 27 soil samples collected during the site investigation were screened for asbestos which indicated potential asbestos within two samples, as chrysotile in trial pit TPE1 and 'possible ACM' in trial pit CATP060.

Quantified analysis was not undertaken on the soil sample from trial pit TPE1 as Atkins states that it lies at depth beneath the road and is not considered to pose a risk to end users.

With regards the possible ACM reported in trial pit CATP060, Atkins reports that fragments of asbestos sheeting were recorded within the Made Ground which was removed by Hydrock in March 2012. The remediation excavation was advanced until all visible ACM had been removed from this area.

Atkins also reports that laboratory screening identified suspected asbestos within three samples of site-won 6F2 crushed concrete which was utilised during the widening of an existing road embankment in the western part of Phase 48. No quantification was undertaken, but Atkins reports that the material was placed beneath the new road at depths greater than 1m below FFL, although is at shallower depth on the embankment side slopes where it is

covered by a thin layer of topsoil. However, given the steepness of the side slopes Atkins considers it unlikely that exposure would occur, and the use of this material at this location is considered to represent low risk in terms of human health.

Despite the recorded asbestos discussed above, the Monitor is satisfied that the soils within Phase 48 are unlikely to pose a significant risk given the intended use of Phase 48.

2.4.6 Removal of Buried Services

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

It is evident from Atkins' validation report (Information Source 9) that a number of live services are present within Phase 48. Despite the wording of the Section 106 Agreement, it is assumed that this requirement relates only to redundant services. Nevertheless, given the apparent lack of contamination sources within Phase 48, it is considered unlikely that the service corridors that are present within Phase 48 could act as a conduit for contamination migration. Therefore the Monitor is satisfied that there is no need for further works in this respect.

2.4.7 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.

2.4.8 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.

As mentioned in Section 1.1 of this report, the construction of the northern access road is nearing completion and as such the final 0.5m of soils have been placed. Atkins has not reported the soil chemical quality of the final 0.5m of soils, but states that their specification for the highway works, a copy of which is included in Atkins' validation report (Information Source 9), includes a clause which states that in the event of visual or olfactory evidence of contamination being encountered, then the works should be temporarily suspended to allow further assessment and appropriate testing. No such occurrences are reported to have occurred, suggesting that the aesthetic criteria are likely to be type 1 or better and as such there is unlikely to be RBSL/RTC exceedances. However it is recognised that visual/olfactory observations would not necessarily identify exceedances for metals. Despite this, given the intended use for the land, the Monitor is satisfied that the soils are unlikely to pose a significant risk to end users.

A topographical record of the ground levels upon which this certificate is based is shown on drawing 5041216-ATK-DR-C-REM-2175 Rev P1 a copy of which is provided in **Appendix F**.

3. CERTIFICATION

3.1 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 7** 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 7 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.	Complete	Refer to Section 2.4.2 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.
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.

Requirement	Status	Comments
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 2.4.5 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.	Not applicable	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.
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 2.4.8 of this report.

3.2 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 48.

3.2.1 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.

No such structures are proposed with Phase 48, so this requirement is not considered to be applicable to this phase.

4. CONCLUSIONS

4.1 RRWCC

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 48 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.

4.2 PWCD

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.

***APPENDIX A DECLARATION OF PHASE
BOUNDARY, INTENDED
USE AND PROPOSED
DEVELOPMENT LAYOUT***



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 January 2016

Our ref:

Coed Darcy Limited
Dumfries House
Dumfries Place
Cardiff
CF10 3ZF

Dear Sirs

Coed Darcy
Monitor Phase 48
Request for Phase Works Completion Date

We hereby give our written request seeking the declaration of the Phase Works Completion Date for Monitor Phase 48 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 48 boundary is shown on the attached Drawing No. 5041216-ATK-DR-C-REM-2149.

The “Intended Use” for Phase 48 is assumed as that of a proposed commercial end use ie highways and associated localised landscaping.

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

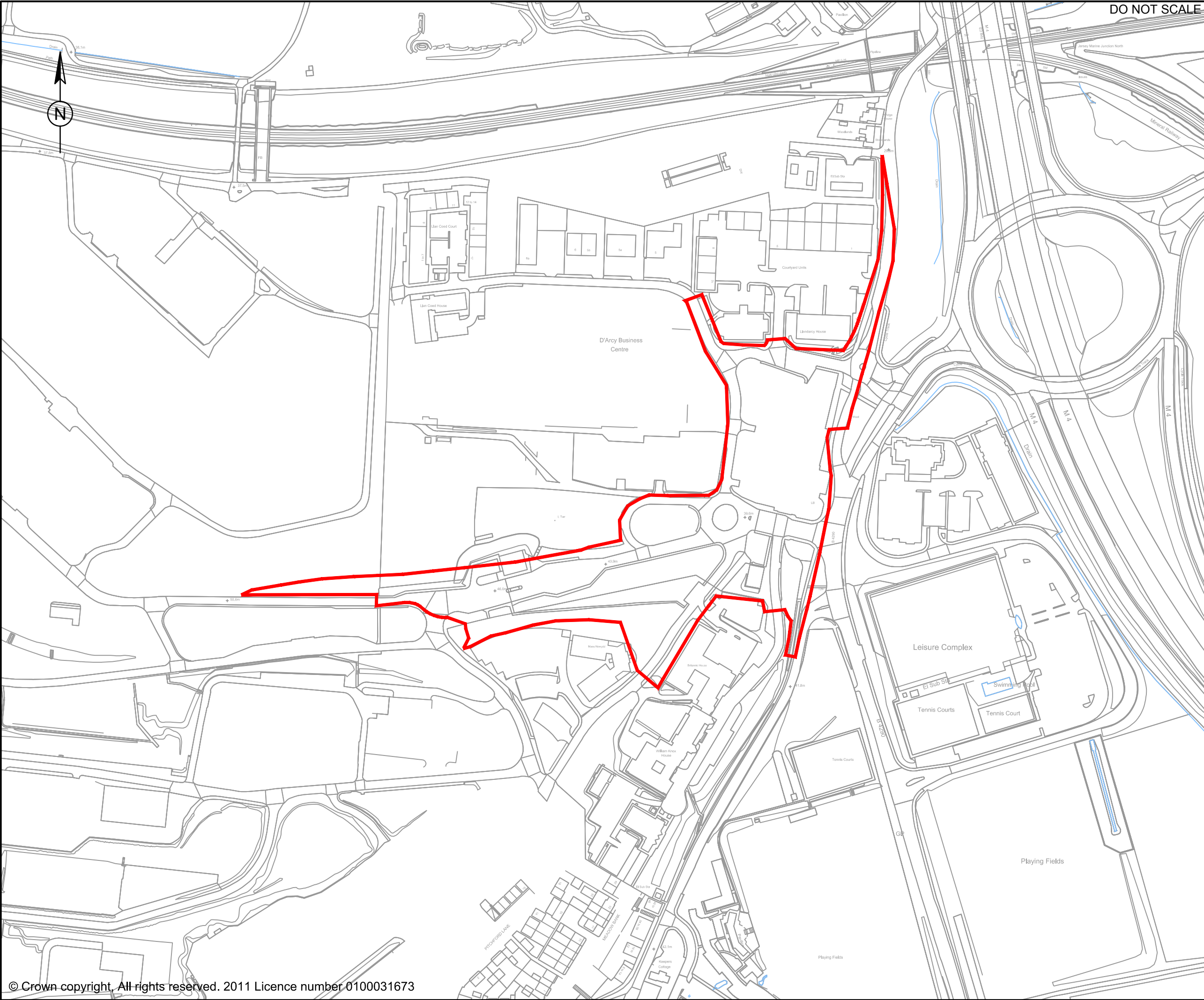
St. Modwen Properties PLC

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

100
0 10
Millimetres



DO NOT SCALE

KEY:
— MONITOR PHASE 48 BOUNDARY

P1	06/01/16	FIRST ISSUE	MJ	ML	MP
Rev.	Date	Description	By	Chk'd	App'd

Drawing Status	S2
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Client

Project Title
COED DARCY

Drawing Title
MONITOR PHASE 48

Scale	Designed	Drawn	Checked	Authorised
1:2500	ML	MJ	ML	MP
Original Size	Date	Date	Date	Date
A3	06/01/16	06/01/16	06/01/16	06/01/16
Drawing Number	Revision			
5041216-ATK-DR-C-REM-DWG-2149	P 1			