

Validated

ALcontrol Laboratories Analytical Services

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No.: 104951

		QC 24	QC 27	QC 27	QC 20
Manganese	TM181	92.68 88.05 : 106.67	96.45 88.05 : 106.67	96.75 88.05 : 106.67	98.10 88.94 : 103.43
Mercury	TM181	114.41 86.66 : 128.64	115.47 86.66 : 128.64	115.11 86.66 : 128.64	115.47 96.85 : 124.11
Molybdenum	TM181	112.19 71.12 : 128.88	120.94 71.12 : 128.88	115.00 71.12 : 128.88	117.50 89.51 : 130.51
Nickel	TM181	99.85 81.27 : 118.73	104.96 81.27 : 118.73	104.96 81.27 : 118.73	105.11 83.34 : 114.35
Phosphorus	TM181	96.29 84.04 : 115.96	99.58 84.04 : 115.96	101.22 84.04 : 115.96	101.37 91.19 : 109.84
Selenium	TM181	108.37 72.61 : 127.39	114.92 72.61 : 127.39	113.71 72.61 : 127.39	116.13 100.15 : 123.30
Strontium	TM181	97.44 80.21 : 119.79	104.05 80.21 : 119.79	100.48 80.21 : 119.79	102.46 89.82 : 110.49
Thallium	TM181	104.00 73.04 : 126.96	107.39 73.04 : 126.96	104.89 73.04 : 126.96	105.41 78.98 : 119.09
Tin	TM181	113.63 71.55 : 128.45	117.75 71.55 : 128.45	115.16 71.55 : 128.45	120.54 103.84 : 124.11
Titanium	TM181	87.38 78.26 : 121.74	98.58 78.26 : 121.74	94.89 78.26 : 121.74	99.58 78.57 : 125.05
Vanadium	TM181	97.54 82.03 : 117.97	104.37 82.03 : 117.97	100.66 82.03 : 117.97	103.28 91.61 : 110.18
Zinc	TM181	93.75 83.18 : 100.43	97.11 83.18 : 100.43	94.00 83.18 : 100.43	98.14 83.65 : 103.15

pH

Component	Method Code	QC 26	QC 20	QC 20	QC 27
pH	TM133	101.00 99.26 : 101.75	100.88 99.26 : 101.75	100.88 99.26 : 101.75	100.50 99.26 : 101.75

pH Value

Component	Method Code	QC 27
pH	TM256	99.43 90.96 : 108.19

Semi Volatile Organic Compounds

Component	Method Code	QC 29	QC 27	QC 22
4-Bromophenylphenylether (Soil)	TM157	88.75 74.30 : 113.57	80.29 61.72 : 116.07	104.50 74.30 : 113.57
Benzo(a)anthracene (Soil)	TM157	84.49 70.77 : 125.72	78.66 60.41 : 125.98	98.35 70.77 : 125.72
Hexachlorobutadiene (Soil)	TM157	89.68 78.65 : 110.23	83.50 66.69 : 115.46	105.43 78.65 : 110.23
Naphthalene (Soil)	TM157	87.38 78.64 : 113.48	82.50 66.96 : 117.88	101.25 78.64 : 113.48
Nitrobenzene (Soil)	TM157	90.12 76.14 : 111.47	85.43 67.54 : 113.96	105.11 76.14 : 111.47
Phenol (Soil)	TM157	87.02 76.77 : 113.80	78.75 28.59 : 134.35	99.63 76.77 : 113.80

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SVOC MS (W) - Aqueous

Component	Method Code	QC 24
4-Bromophenylphenylether	TM176	81.71 74.07 : 108.33
Benzo(a)anthracene	TM176	78.61 64.51 : 105.49
Benzo(a)pyrene	TM176	70.51 53.03 : 98.81
Butylbenzyl phthalate	TM176	83.54 63.86 : 115.28
Hexachlorobutadiene	TM176	64.20 45.86 : 100.88
Naphthalene	TM176	80.23 75.05 : 106.07
Nitrobenzene	TM176	75.96 69.60 : 106.80
Phenol	TM176	52.64 45.42 : 71.52

Total Organic Carbon

Component	Method Code	QC 27	QC 28
Total Organic Carbon	TM132	99.29 88.75 : 104.70	93.09 88.75 : 104.70

VOC MS (S)

Component	Method Code	QC 20	QC 23
1,1,1,2-tetrachloroethane	TM116	104.02 67.13 : 142.65	101.15 67.13 : 142.65
1,1,1-Trichloroethane	TM116	101.98 65.91 : 140.05	94.29 65.91 : 140.05
1,1,2-Trichloroethane	TM116	112.67 74.80 : 158.96	110.71 74.80 : 158.96
1,1-Dichloroethane	TM116	101.52 69.50 : 147.71	96.57 69.50 : 147.71
1,2-Dichloroethane	TM116	109.51 72.54 : 154.14	100.39 72.54 : 154.14
1,4-Dichlorobenzene	TM116	109.55 71.88 : 152.75	98.33 71.88 : 152.75
2-Chlorotoluene	TM116	132.53 85.48 : 181.65	118.17 85.48 : 181.65
4-Chlorotoluene	TM116	126.84 83.61 : 177.68	117.47 83.61 : 177.68
Benzene	TM116	104.01 68.68 : 145.95	99.25 68.68 : 145.95
Carbon Disulphide	TM116	87.34 62.91 : 133.68	80.04 62.91 : 133.68
Carbontetrachloride	TM116	105.28 72.85 : 154.80	96.52 72.85 : 154.80
Chlorobenzene	TM116	108.89 68.63 : 145.84	100.09 68.63 : 145.84
Chloroform	TM116	105.83 69.66 : 148.03	96.62 69.66 : 148.03

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		QC 20	QC 23
Chloromethane	TM116	89.61 75.93 : 161.35	94.20 75.93 : 161.35
Cis-1,2-Dichloroethene	TM116	96.04 64.50 : 137.05	92.08 64.50 : 137.05
Dibromomethane	TM116	89.59 65.13 : 138.40	101.45 65.13 : 138.40
Dichloromethane	TM116	100.42 70.67 : 150.15	96.01 70.67 : 150.15
Ethylbenzene	TM116	105.69 66.97 : 142.30	98.02 66.97 : 142.30
Hexachlorobutadiene	TM116	152.06 57.99 : 152.88	83.93 57.99 : 152.88
Isopropylbenzene	TM116	96.17 58.08 : 123.43	84.99 58.08 : 123.43
Naphthalene	TM116	110.27 74.41 : 158.12	106.41 74.41 : 158.12
o-Xylene	TM116	99.87 64.13 : 136.27	96.57 64.13 : 136.27
p/m-Xylene	TM116	107.81 66.95 : 142.28	98.13 66.95 : 142.28
Sec-Butylbenzene	TM116	109.34 65.24 : 138.64	76.39 65.24 : 138.64
Tetrachloroethene	TM116	112.02 71.55 : 152.05	109.07 71.55 : 152.05
Toluene	TM116	105.48 65.92 : 140.08	97.41 65.92 : 140.08
Trichloroethene	TM116	104.66 67.45 : 143.34	96.78 67.45 : 143.34
Trichlorofluoromethane	TM116	100.41 61.94 : 131.64	89.75 61.94 : 131.64
Vinyl Chloride	TM116	94.96 66.45 : 141.20	86.64 66.45 : 141.20

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.107

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Moisture Content Ratio (%)

Dry Matter Content Ratio (%)

Contract Chemicals

19.1

84.0

Case

SDG 101115-88

Lab Sample Number(s) 2405930

Sampled Date 15-Nov-2010

Customer Sample Ref. HDP 2 / Leach

Depth (m) 0.10

Solid Waste Analysis

Result

Total Organic Carbon (%)

Loss on Ignition (%)

Sum of BTEX (mg/kg)

Sum of 7 PCBs (mg/kg)

Mineral Oil (mg/kg)

PAH Sum of 17 (mg/kg)

pH (pH Units)

ANC to pH 6 (mol/kg)

ANC to pH 4 (mol/kg)

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Arsenic	0.0322	<0.00012	0.322	<0.0012	-	-	-
Barium	-	-	-	-	-	-	-
Cadmium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Chromium	0.00174	<0.00022	0.0174	<0.0022	-	-	-
Copper	0.00653	<0.00085	0.0653	<0.0085	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	0.00245	<0.00015	0.0245	<0.0015	-	-	-
Lead	0.0011	<0.00002	0.011	<0.0002	-	-	-
Antimony	-	-	-	-	-	-	-
Selenium	0.112	<0.00039	1.12	<0.0039	-	-	-
Zinc	0.00278	<0.00041	0.0278	<0.0041	-	-	-
Chloride	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-
Sulphate (soluble)	41.6	<3	416	<30	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	-
Total Monohydric Phenols (W)	-	-	-	-	-	-	-
Dissolved Organic Carbon	-	-	-	-	-	-	-

Leach Test Information

Date Prepared 16-Nov-2010

pH (pH Units) 8.08

Conductivity (µS/cm) 281.00

Temperature (°C) 19.90

Volume Leachant (Litres) 0.883

Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Meets Certification does not apply to leachates

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WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Contract Chemicals
Mass Sample taken (kg)	0.107	Moisture Content Ratio (%)	19.1
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	84.0
Particle Size <4mm	>95%		

Case	
SDG	101115-88
Lab Sample Number(s)	2405930
Sampled Date	15-Nov-2010
Customer Sample Ref.	HDP 2 / Leach
Depth (m)	0.10

Solid Waste Analysis

Result

Total Organic Carbon (%)	-	-	-
Loss on Ignition (%)	-	-	-
Sum of BTEX (mg/kg)	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-
Mineral Oil (mg/kg)	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-
pH (pH Units)	-	-	-
ANC to pH 6 (mol/kg)	-	-	-
ANC to pH 4 (mol/kg)	-	-	-

Eluate Analysis	C2 Conc ⁿ in 10:1 eluate (mg/l)		A2 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg
	Result	Limit of Detection	Result	Limit of Detection	
1,1,1,2-Tetrachloroethane	<0.0013	<0.0013	<0.013	<0.013	-
1,1,1-Trichloroethane	<0.0013	<0.0013	<0.013	<0.013	-
1,1,2,2-Tetrachloroethane	<0.0052	<0.0052	<0.052	<0.052	-
1,1,2-Trichloroethane	<0.0022	<0.0022	<0.022	<0.022	-
1,1-Dichloroethane	<0.0012	<0.0012	<0.012	<0.012	-
1,1-Dichloroethene	<0.0012	<0.0012	<0.012	<0.012	-
1,1-Dichloropropene	<0.0013	<0.0013	<0.013	<0.013	-
1,2,3-Trichlorobenzene	<0.0031	<0.0031	<0.031	<0.031	-
1,2,3-Trichloropropane	<0.0078	<0.0078	<0.078	<0.078	-
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.023	<0.023	-
1,2,4-Trimethylbenzene	<0.0017	<0.0017	<0.017	<0.017	-
1,2-Dibromo-3-Chloropropane	<0.0098	<0.0098	<0.098	<0.098	-
1,2-Dibromoethane	<0.0023	<0.0023	<0.023	<0.023	-
1,2-Dichlorobenzene	0.0694	<0.0037	0.694	<0.037	-
1,2-Dichloroethane	<0.0033	<0.0033	<0.033	<0.033	-
1,2-Dichloropropane	<0.003	<0.003	<0.03	<0.03	-
1,3,5-Trichlorobenzene	<0.01	<0.01	<0.1	<0.1	-
1,3,5-Trimethylbenzene	<0.0018	<0.0018	<0.018	<0.018	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.022	<0.022	-
1,3-Dichloropropane	<0.0022	<0.0022	<0.022	<0.022	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.027	<0.027	-
2,2-Dichloropropane	<0.0038	<0.0038	<0.038	<0.038	-
2,4,5-Trichlorophenol	<0.001	<0.001	<0.01	<0.01	-
2,4,6-Trichlorophenol	<0.001	<0.001	<0.01	<0.01	-
2,4-Dichlorophenol	<0.001	<0.001	<0.01	<0.01	-
2,4-Dimethylphenol	<0.001	<0.001	<0.01	<0.01	-
2,4-Dinitrotoluene	<0.001	<0.001	<0.01	<0.01	-
2,6-Dinitrotoluene	<0.001	<0.001	<0.01	<0.01	-
2-Butanone	<0.1	<0.1	<1	<1	-

Leach Test Information

Date Prepared	16-Nov-2010
pH (pH Units)	8.08
Conductivity (µS/cm)	281.00
Temperature (°C)	19.90
Volume Leachant (Litres)	0.883
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
 Mcerts Certification does not apply to leachates
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CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.107

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Moisture Content Ratio (%)

Dry Matter Content Ratio (%)

Contract Chemicals

19.1

84.0

Case

SDG 101115-88

Lab Sample Number(s) 2405930

Sampled Date 15-Nov-2010

Customer Sample Ref. HDP 2 / Leach

Depth (m) 0.10

Solid Waste Analysis

Result

Total Organic Carbon (%)

Loss on Ignition (%)

Sum of BTEX (mg/kg)

Sum of 7 PCBs (mg/kg)

Mineral Oil (mg/kg)

PAH Sum of 17 (mg/kg)

pH (pH Units)

ANC to pH 6 (mol/kg)

ANC to pH 4 (mol/kg)

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

	Result	Limit of Detection	Result	Limit of Detection	
2-Chloronaphthalene	<0.001	<0.001	<0.01	<0.01	-
2-Chlorophenol	<0.001	<0.001	<0.01	<0.01	-
2-Chlorotoluene	<0.0019	<0.0019	<0.019	<0.019	-
2-Methylnaphthalene	<0.001	<0.001	<0.01	<0.01	-
2-Methylphenol	<0.001	<0.001	<0.01	<0.01	-
2-Nitroaniline	<0.001	<0.001	<0.01	<0.01	-
2-Nitrophenol	<0.001	<0.001	<0.01	<0.01	-
3-Nitroaniline	<0.001	<0.001	<0.01	<0.01	-
4-Bromofluorobenzene	-	<0	-	<0	-
4-Bromophenylphenylether	<0.001	<0.001	<0.01	<0.01	-
4-Chloro-3-methylphenol	<0.001	<0.001	<0.01	<0.01	-
4-Chloroaniline	<0.001	<0.001	<0.01	<0.01	-
4-Chlorophenylphenylether	<0.001	<0.001	<0.01	<0.01	-
4-Chlorotoluene	<0.0019	<0.0019	<0.019	<0.019	-
4-Isopropyltoluene	<0.0026	<0.0026	<0.026	<0.026	-
4-Methylphenol	<0.001	<0.001	<0.01	<0.01	-
4-Nitroaniline	<0.001	<0.001	<0.01	<0.01	-
4-Nitrophenol	<0.001	<0.001	<0.01	<0.01	-
Acenaphthene	<0.001	<0.001	<0.01	<0.01	-
Acenaphthylene	<0.001	<0.001	<0.01	<0.01	-
Acetone	<0.1	<0.1	<1	<1	-
Aliphatics >C10-C12	0.051	<0.01	0.51	<0.1	-
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-
Aliphatics >C6-C8	0.047	<0.01	0.47	<0.1	-
Aliphatics >C8-C10	0.013	<0.01	0.13	<0.1	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-
Anthracene	<0.001	<0.001	<0.01	<0.01	-

Leach Test Information

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Case

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Lab Sample Number(s) 2405930

Sampled Date 15-Nov-2010

Customer Sample Ref. HDP 2 / Leach

Depth (m) 0.10

Solid Waste Analysis

Result

Total Organic Carbon (%)

Loss on Ignition (%)

Sum of BTEX (mg/kg)

Sum of 7 PCBs (mg/kg)

Mineral Oil (mg/kg)

PAH Sum of 17 (mg/kg)

pH (pH Units)

ANC to pH 6 (mol/kg)

ANC to pH 4 (mol/kg)

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Aromatics >C7-C8

Aromatics >EC10-EC12

Aromatics >EC12-EC16

Aromatics >EC16-EC21

Aromatics >EC21-EC35

Aromatics >EC8-EC10

Aromatics C6-C7

Azobenzene

Benzene

Benzene by GC

Benzo(a)anthracene

Benzo(a)pyrene

Benzo(b)fluoranthene

Benzo(ghi)perylene

Benzo(k)fluoranthene

Bis(2-chloroethoxy)methane

Bis(2-chloroethyl)ether

Bis(2-ethylhexyl) phthalate

Bromobenzene

Bromochloromethane

Bromodichloromethane

Bromoform

Bromomethane

Butylbenzyl phthalate

Carbazole

Carbon Disulphide

Carbontetrachloride

Chlorobenzene

Chloroethane

Leach Test Information

Date Prepared 16-Nov-2010

pH (pH Units) 8.08

Conductivity (µS/cm) 281.00

Temperature (°C) 19.00

Volume Leachant (Litres) 0.883

Volume of Eluate VE1 (Litres)

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Client Reference

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 Mass of dry sample (kg) 0.175
 Particle Size <4mm >95%

Site Location

Moisture Content Ratio (%) 19.1
 Dry Matter Content Ratio (%) 84.0

Contract Chemicals

Case

SDG 101115-88
 Lab Sample Number(s) 2405930
 Sampled Date 15-Nov-2010
 Customer Sample Ref. HDP 2 / Leach
 Depth (m) 0.10

Solid Waste Analysis

Result

Total Organic Carbon (%) -
 Loss on Ignition (%) -
 Sum of BTEX (mg/kg) -
 Sum of 7 PCBs (mg/kg) -
 Mineral Oil (mg/kg) -
 PAH Sum of 17 (mg/kg) -
 pH (pH Units) -
 ANC to pH 6 (mol/kg) -
 ANC to pH 4 (mol/kg) -

Eluate Analysis

C2 Concⁿ in 10:1 eluate (mg/l)A2 10:1 concⁿ leached (mg/kg)

Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg

	Result	Limit of Detection	Result	Limit of Detection	
Chloroform	<0.0018	<0.0018	<0.018	<0.018	-
Chloromethane	<0.009	<0.009	<0.09	<0.09	-
Chromium III	<0.03	<0.03	<0.3	<0.3	-
Chrysene	<0.001	<0.001	<0.01	<0.01	-
Cis-1,2-Dichloroethene	<0.0023	<0.0023	<0.023	<0.023	-
Cis-1,3-Dichloropropene	<0.0019	<0.0019	<0.019	<0.019	-
Dibenzo(a,h)anthracene	<0.001	<0.001	<0.01	<0.01	-
Dibenzofuran	<0.001	<0.001	<0.01	<0.01	-
Dibromochloromethane	<0.0017	<0.0017	<0.017	<0.017	-
Dibromofluoromethane	-	<0	-	<0	-
Dibromomethane	<0.0027	<0.0027	<0.027	<0.027	-
Dichlorodifluoromethane	<0.007	<0.007	<0.07	<0.07	-
Dichloromethane	<0.0037	<0.0037	<0.037	<0.037	-
Diethyl phthalate	<0.001	<0.001	<0.01	<0.01	-
Dimethyl phthalate	<0.001	<0.001	<0.01	<0.01	-
Di-n-butyl phthalate	<0.001	<0.001	<0.01	<0.01	-
Di-n-Octyl phthalate	<0.005	<0.005	<0.05	<0.05	-
Ethanol	<0.1	<0.1	<1	<1	-
Ethyl Acetate	<0.1	<0.1	<1	<1	-
Ethylbenzene	<0.0025	<0.0025	<0.025	<0.025	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-
Fluoranthene	<0.001	<0.001	<0.01	<0.01	-
Fluorene	<0.001	<0.001	<0.01	<0.01	-
GRO TOT (C5-C12)	0.161	<0.05	1.61	<0.5	-
Hexachlorobenzene	<0.001	<0.001	<0.01	<0.01	-
Hexachlorobutadiene	<0.001	<0.001	<0.01	<0.01	-
Hexachlorocyclopentadiene	<0.001	<0.001	<0.01	<0.01	-
Hexachloroethane	<0.001	<0.001	<0.01	<0.01	-
Hexavalent Chromium	<0.03	<0.03	<0.3	<0.3	-

Leach Test Information

Date Prepared 16-Nov-2010
 pH (pH Units) 8.08
 Conductivity (µS/cm) 281.00
 Temperature (°C) 19.90
 Volume Leachant (Litres) 0.883
 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
 Merts Certification does not apply to leachates

28/11/2010 15:08:40



WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.107

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Moisture Content Ratio (%) 19.1

Dry Matter Content Ratio (%) 84.0

Contract Chemicals

Case

SDG 101115-88

Lab Sample Number(s) 2405930

Sampled Date 15-Nov-2010

Customer Sample Ref. HDP 2 / Leach

Depth (m) 0.10

Solid Waste Analysis

Result

Total Organic Carbon (%) -

Loss on Ignition (%) -

Sum of BTEX (mg/kg) -

Sum of 7 PCBs (mg/kg) -

Mineral Oil (mg/kg) -

PAH Sum of 17 (mg/kg) -

pH (pH Units) -

ANC to pH 6 (mol/kg) -

ANC to pH 4 (mol/kg) -

Eluate Analysis

C2

Concⁿ in 10:1 eluate (mg/l)

A2

10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

	Result	Limit of Detection	Result	Limit of Detection	
Indeno (1,2,3-cd) Pyrene	<0.001	<0.001	<0.01	<0.01	-
iso-Butanol	<0.1	<0.1	<1	<1	-
Isophorone	<0.001	<0.001	<0.01	<0.01	-
iso-Propanol	<0.1	<0.1	<1	<1	-
iso-Propyl Acetate	<0.1	<0.1	<1	<1	-
Isopropylbenzene	<0.0014	<0.0014	<0.014	<0.014	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-
Methanol	<0.1	<0.1	<1	<1	-
Methyl Acetate	<0.1	<0.1	<1	<1	-
Methyl-isoButyl-Ketone	<0.1	<0.1	<1	<1	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-
Naphthalene	<0.001	<0.001	<0.01	<0.01	-
n-Butanol	<0.1	<0.1	<1	<1	-
n-Butyl Acetate	<0.1	<0.1	<1	<1	-
n-Butylbenzene	<0.002	<0.002	<0.02	<0.02	-
n-Heptanol	<0.1	<0.1	<1	<1	-
n-Hexanol	<0.1	<0.1	<1	<1	-
Nitrobenzene	0.00209	<0.001	0.0209	<0.01	-
N-nitrosodi-n-propylamine	<0.001	<0.001	<0.01	<0.01	-
n-Pentanol	<0.1	<0.1	<1	<1	-
n-Propanol	<0.1	<0.1	<1	<1	-
n-Propyl Acetate	<0.1	<0.1	<1	<1	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-
o-Xylene	<0.0017	<0.0017	<0.017	<0.017	-
p/m-Xylene	<0.0025	<0.0025	<0.025	<0.025	-
Pentachlorophenol	<0.001	<0.001	<0.01	<0.01	-
pH	7.9	<0.001	79	<0.01	-
Phenanthrene	<0.001	<0.001	<0.01	<0.01	-
Phenol	<0.001	<0.001	<0.01	<0.01	-

Leach Test Information

Date Prepared 16-Nov-2010

pH (pH Units) 8.08

Conductivity (µS/cm) 281.00

Temperature (°C) 19.90

Volume Leachant (Litres) 0.883

Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Meets Certification does not apply to leachates

26/11/2010 15:08:40

CEN 10:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.107

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Moisture Content Ratio (%)

Dry Matter Content Ratio (%)

Contract Chemicals

19.1

84.0

Case

SDG 101115-88

Lab Sample Number(s) 2405930

Sampled Date 15-Nov-2010

Customer Sample Ref. HDP 2 / Leach

Depth (m) 0.10

Solid Waste Analysis

Result

Total Organic Carbon (%)

Loss on Ignition (%)

Sum of BTEX (mg/kg)

Sum of 7 PCBs (mg/kg)

Mineral Oil (mg/kg)

PAH Sum of 17 (mg/kg)

pH (pH Units)

ANC to pH 6 (mol/kg)

ANC to pH 4 (mol/kg)

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

	Result	Limit of Detection	Result	Limit of Detection	
Propylbenzene	<0.0026	<0.0026	<0.026	<0.026	-
Pyrene	<0.001	<0.001	<0.01	<0.01	-
sec-Butanol	<0.1	<0.1	<1	<1	-
Sec-Butylbenzene	<0.0017	<0.0017	<0.017	<0.017	-
Styrene	<0.0012	<0.0012	<0.012	<0.012	-
Sum m&p and o Xylene by GC	<0.01	<0.01	<0.1	<0.1	-
Sum of BTEX by GC	<0.01	<0.01	<0.1	<0.1	-
Surrogate Recovery	-	<0	-	<0	-
SVOC TIC	-	<0	-	<0	-
Tert-amyl methyl ether	<0.001	<0.001	<0.01	<0.01	-
tert-Butyl Alcohol	<0.01	<0.01	<0.1	<0.1	-
Tert-butyl methyl ether	<0.0016	<0.0016	<0.016	<0.016	-
Tert-Butylbenzene	<0.002	<0.002	<0.02	<0.02	-
Tetrachloroethene	<0.0015	<0.0015	<0.015	<0.015	-
Tetrahydrofuran	<0.1	<0.1	<1	<1	-
Toluene	<0.0014	<0.0014	<0.014	<0.014	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-
Toluene-d8	-	<0	-	<0	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-
Total Aromatics >EC12-EC35	0.013	<0.01	0.13	<0.1	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	0.175	<0.01	1.75	<0.1	-
Trans-1,2-Dichloroethene	<0.0019	<0.0019	<0.019	<0.019	-
Trans-1,3-Dichloropropene	<0.0035	<0.0035	<0.035	<0.035	-
Trichloroethene	<0.0025	<0.0025	<0.025	<0.025	-
Trichlorofluoromethane	<0.0013	<0.0013	<0.013	<0.013	-
Vinyl Chloride	<0.0012	<0.0012	<0.012	<0.012	-
VOC TIC	-	<0	-	<0	-

Leach Test Information

Date Prepared	16-Nov-2010
pH (pH Units)	8.08
Conductivity (µS/cm)	281.00
Temperature (°C)	19.90
Volume Leachant (Litres)	0.883
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
 Merts Certification does not apply to leachates

26/11/2010 15:08:40

Table of Results - Appendix

SDG Number : 101115-88

Client : H_ENTEC_NWC

Client Ref : 29060

REPORT KEY

NDP	No Determination Possible	#	ISO 17025 Accredited	•	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage Batch Test 2:1/8:1 Cumulative		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (HTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990; BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM155	In - house Method	Determination of Alcohols and Acetates by Headspace GC-FID		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media - Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media - Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM232	USEPA Method No. 8260b 'Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC-MS)'	Determination of Volatile Alcohols, Acetates and Ketones in Waters by Headspace GC-MS		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1990.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM243				
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC NWC
Sample Number - 2410557 / HDP 3[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 19/11/10
Analyst - I. Povilonyte

[illegible]

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SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC_NWC
Sample Number - 2410607 / HDP 3[0.60]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 19/11/10
Analyst - I. Povilyonite

Tentative Compound Identification	Retention Time min	Concentration µg/kg
Benzenamine, methylenebis-dimethyl-	11.62	1565

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULTS

SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC_NWC
Sample Identity - 2410812/ HDP 1[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 17/11/10
Analyst - R Maguire

Tentative Compound Identification	Retention Time min	Concentration µg/kg
No Compounds Detected	-	<1000

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE
CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULT

SVOC Tentatively Identified Compounds

Tentative Compound Identification	Retention Time min	Concentration µg/kg
Methanone, diphenyl-	8.22	3203

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SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC_NWC
Sample Number - 2410886 / HDP 5[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 19/11/10
Analyst - I. Povilonyte

[illegible]

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SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC_NWC
Sample Identity - 2410930/ HDP 2[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 17/11/10
Analyst - R Maguire

Tentative Compound Identification	Retention Time min	Concentration µg/kg
No Compounds Detected	-	<1000

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE
CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULT

SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC_NWC
Sample Identity - 2411001/HDP 2[0.70]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 17/11/10
Analyst - R Maguire

[illegible]

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE
CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULT

SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC_NWC
Sample Identity - 2411042/HDP 4[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 17/11/10
Analyst - R Maguire

[illegible]

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULT

Alcontrol Laboratories

SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H ENTEC NWC
Sample Identity - 2421127 / HDP 5[0.50]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 18/11/10
Date Reported - 19/11/10
Analyst - L. Povilonyte

Tentative Compound Identification	Retention Time min	Concentration µg/kg
Dimethylbenzene isomer	2.89	1631

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE
CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULT

VOC Tentatively Identified Compounds

Job Number - 101115-88
Customer - Entec Ltd
Sample Identity - 2405953/ HDP 3[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 19/11/10
Date Reported - 22/11/10
Analyst - J.Wilson

Tentative Compound Identification	Retention Time min	Concentration µg/kg
Bromo methyl benzene isomer	4.36	416
Dimethyl undecane	4.45	174
Unknown	4.72	127

Please Note: the identification and semi-quantification of these tentatively identified compounds is outside the scope of the UKAS accreditation for this method

ALcontrol Laboratories

VOC Tentatively Identified Compounds

Job Number - 101115-88
Customer - Entec Ltd
Sample Identity - 2405992/ HDP 4[0.10]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 19/11/10
Date Reported - 22/11/10
Analyst - J.Wilson

Tentative Compound Identification	Retention Time min	Concentration μg/kg
Bromo undecane	5.14	22960

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULTS

Please Note: the identification and semi-quantification of these tentatively identified compounds is outside the scope of the UKAS accreditation for this method

ALcontrol Laboratories**VOC Tentatively Identified Compounds**

Job Number - 101115-88
Customer - Entec Ltd
Sample Identity - 2406011/ HDP 4[0.70]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 19/11/10
Date Reported - 22/11/10
Analyst - J.Wilson

Tentative Compound Identification	Retention Time min	Concentration µg/kg
Bromo decane	5.141	107

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULTS

Please Note: the identification and semi-quantification of these tentatively identified compounds is outside the scope of the
UKAS accreditation for this method

ALcontrol Laboratories

VOC Tentatively Identified Compounds

Job Number - 101115-88
Customer - Entec Ltd
Sample Identity - 2405970/ HDP 3[0.60]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 19/11/10
Date Reported - 22/11/10
Analyst - J.Wilson

[illegible]

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULTS

Please Note: the identification and semi-quantification of these tentatively identified compounds is outside the scope of the UKAS accreditation for this method

SVOC Tentatively Identified Compounds

SDG - 101115-88
Client - H_ENTEC NWC
Sample Number - 2410745 / HDP 4[0.70]-SOIL
Sample Type [Units] - Soil - µg/kg
Date Acquired - 17/11/10
Date Reported - 19/11/10
Analyst - I. Povilonyte

[illegible]

TIC RESULTS ARE REPORTED ON AN AS RECEIVED BASIS AND ARE NOT MOISTURE CORRECTED
MAY INCLUDE PREVIOUSLY QUANTIFIED RESULTS

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. Surrogate recoveries – Most of our organic methods include surrogates, the recovery of which is monitored and reported.
For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. Product analyses – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as $\mu\text{g/kg}$ or $\mu\text{g/l}$. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

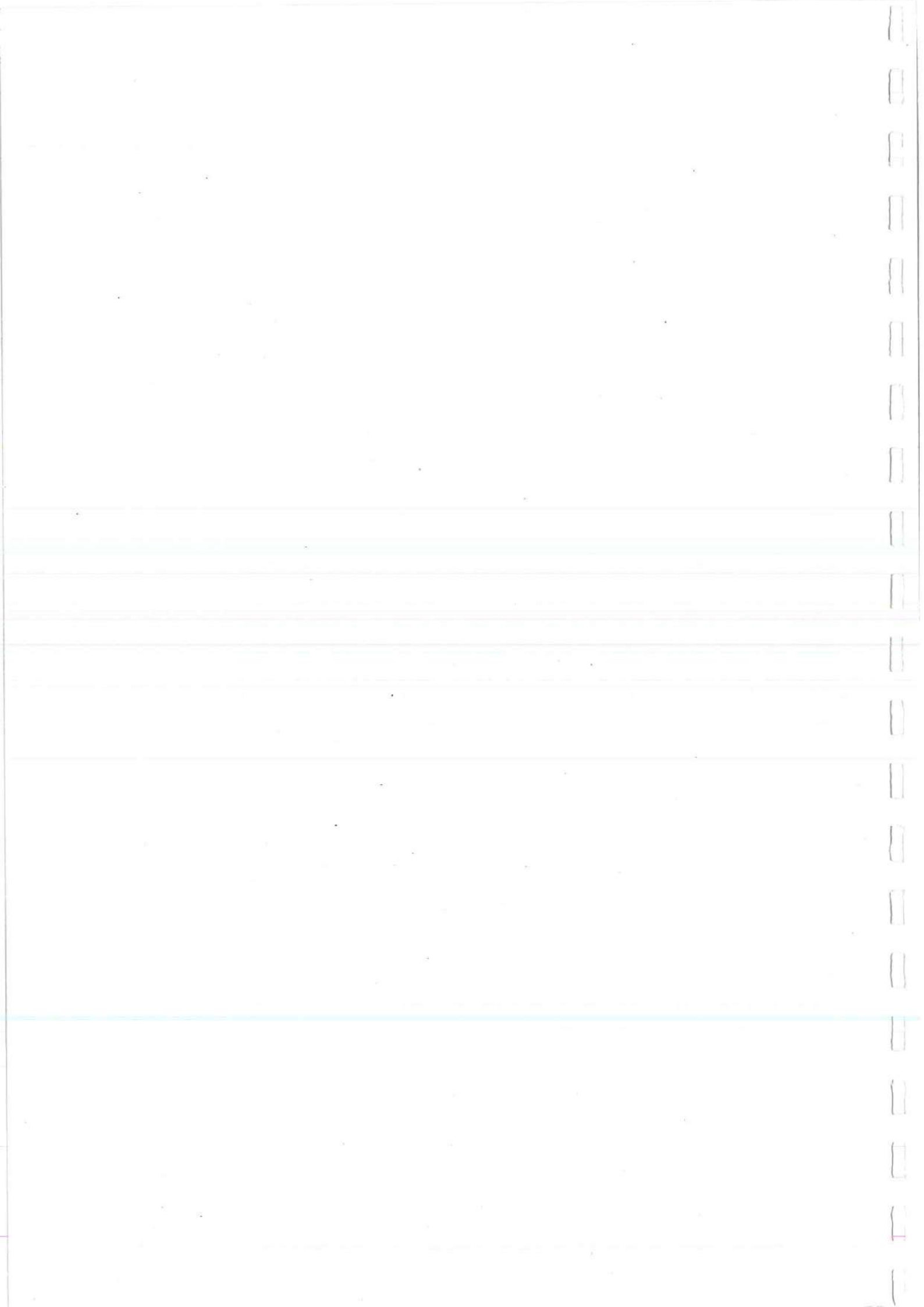
Common Name

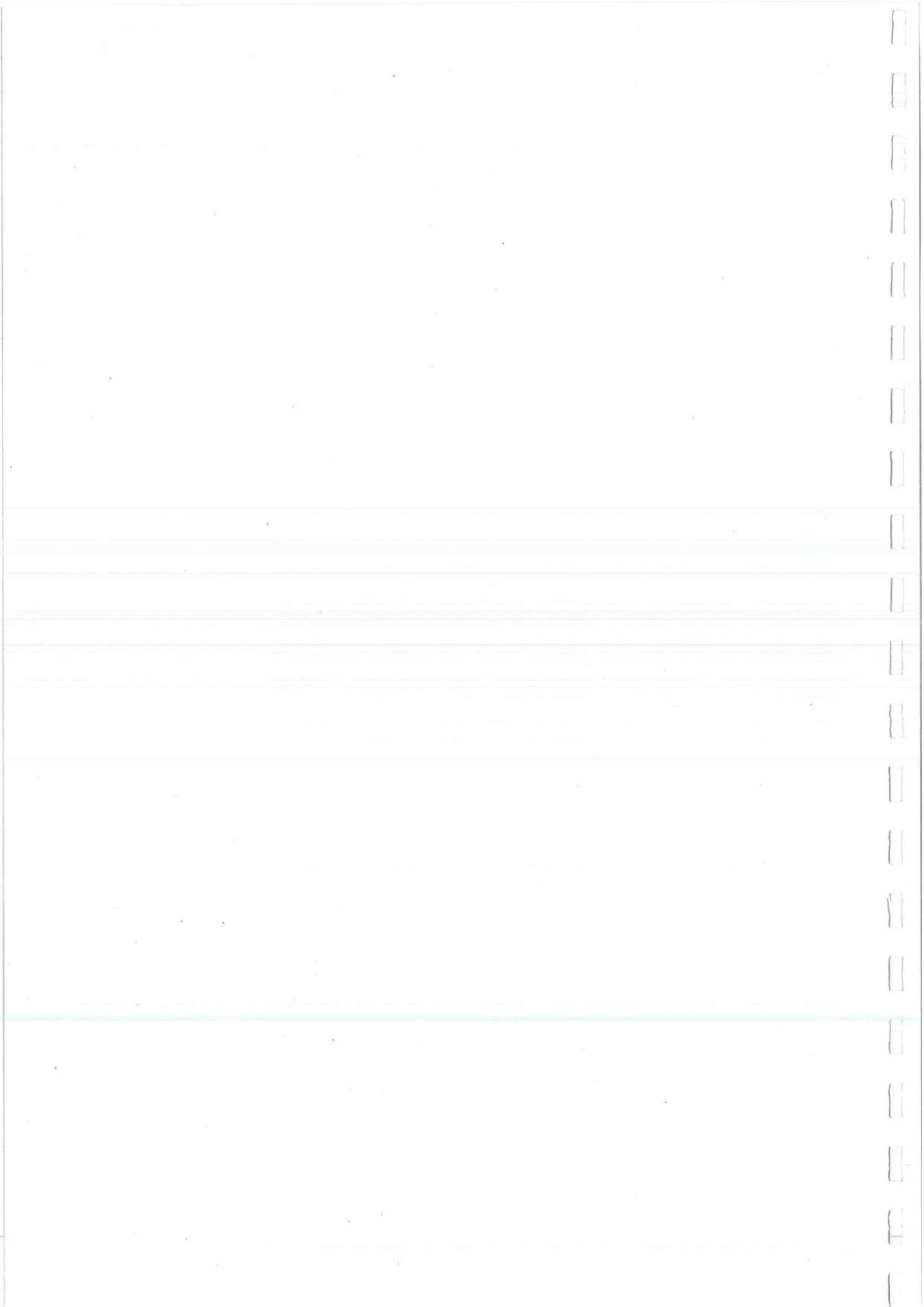
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

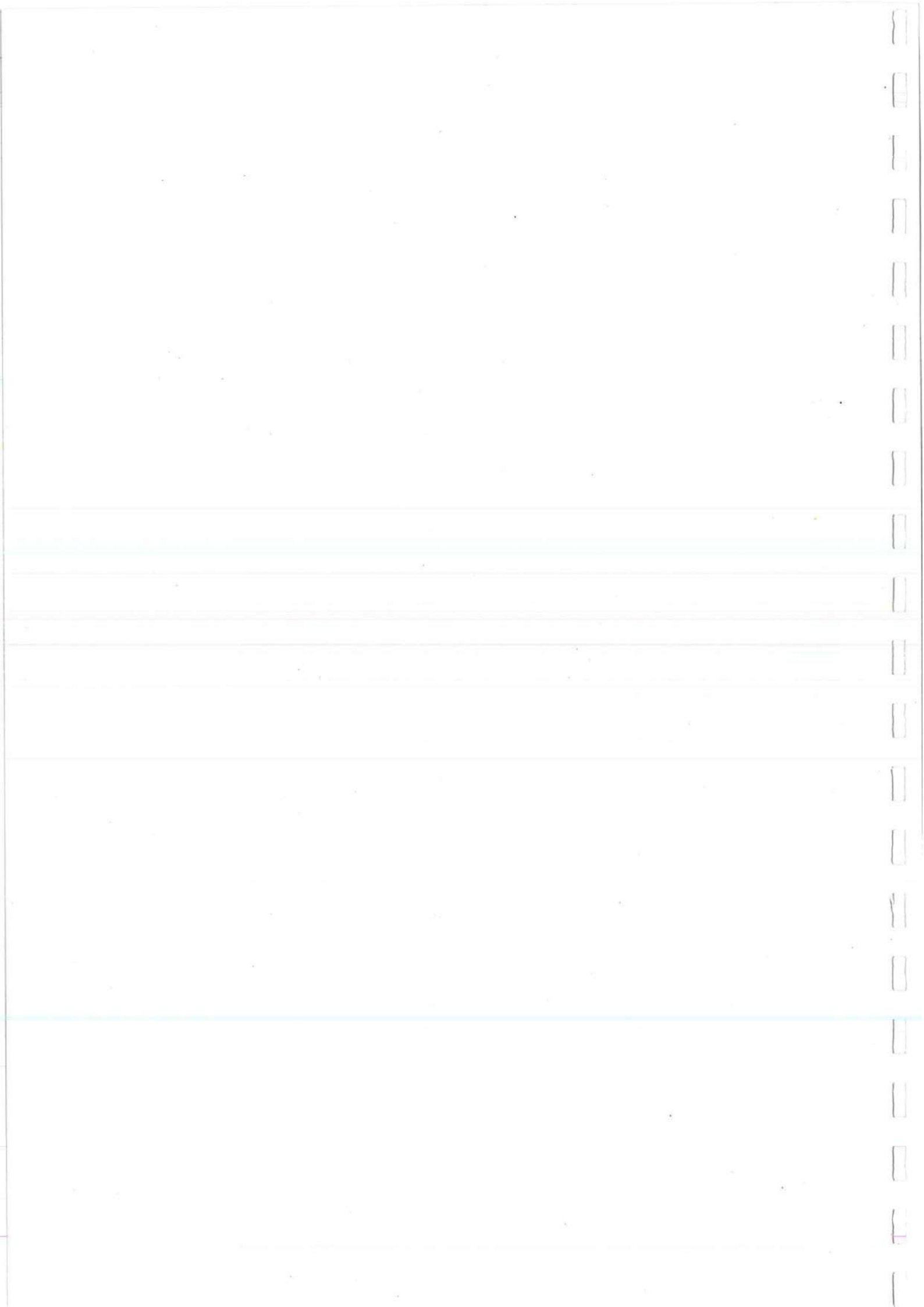
Appendix B

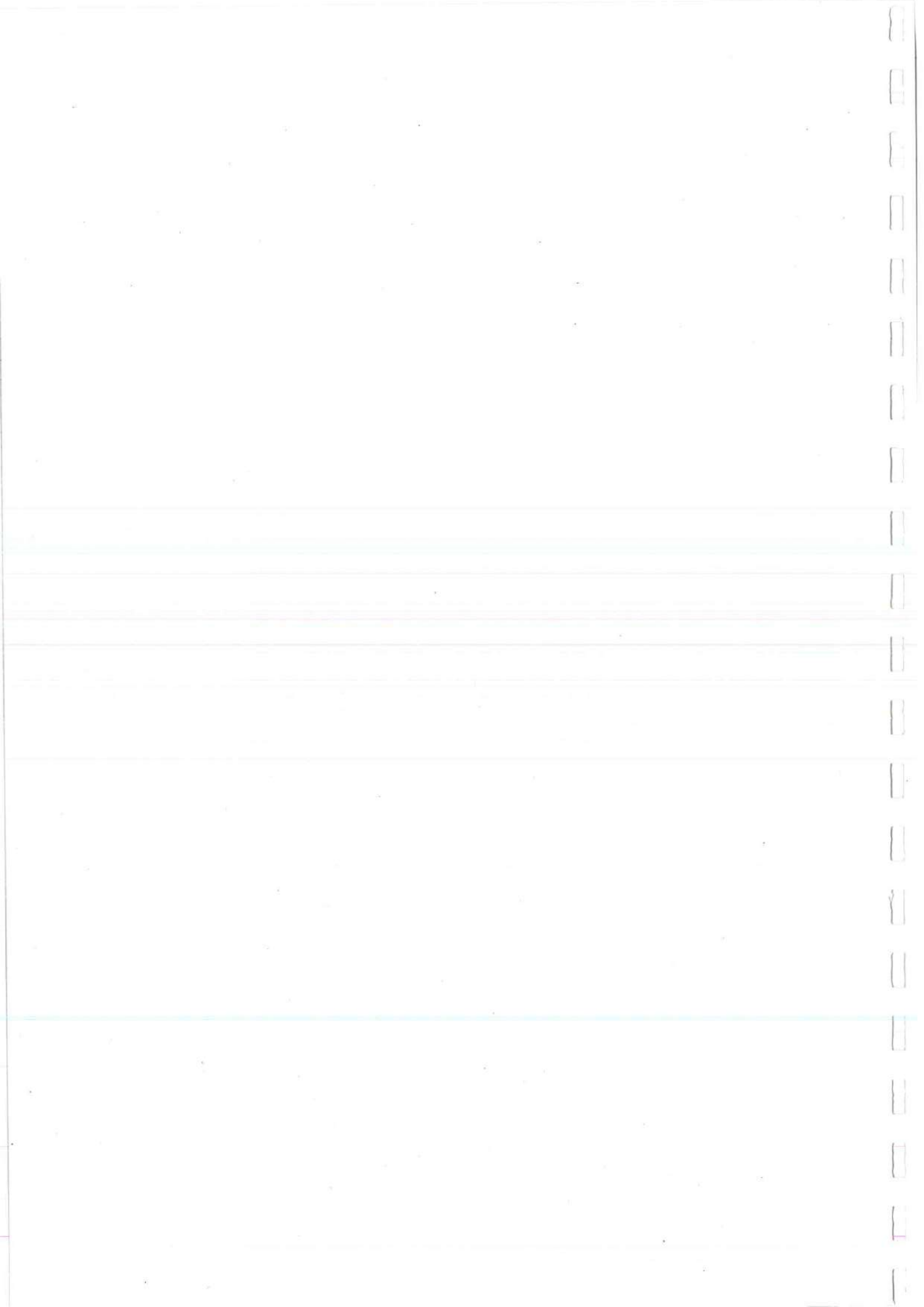
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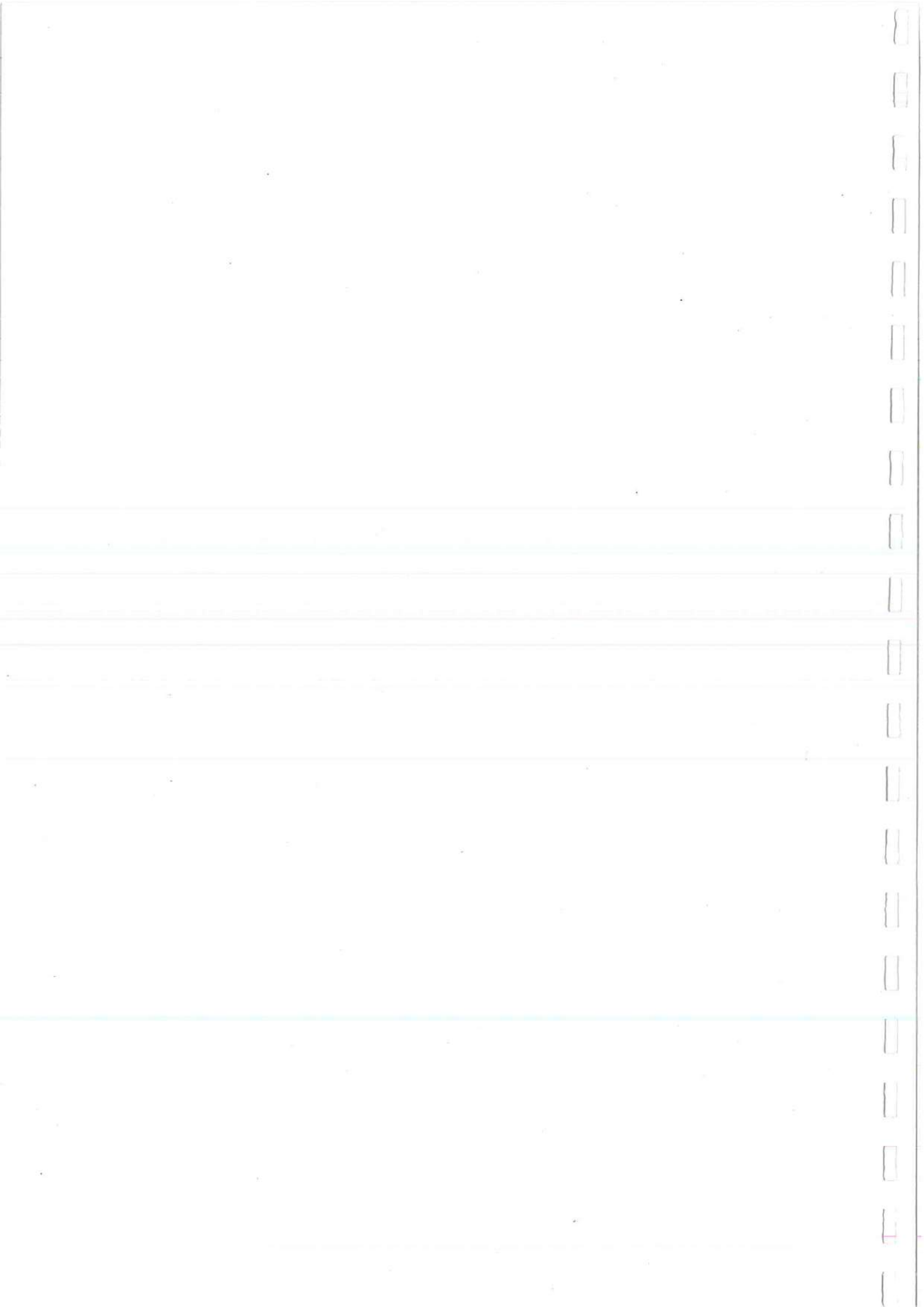
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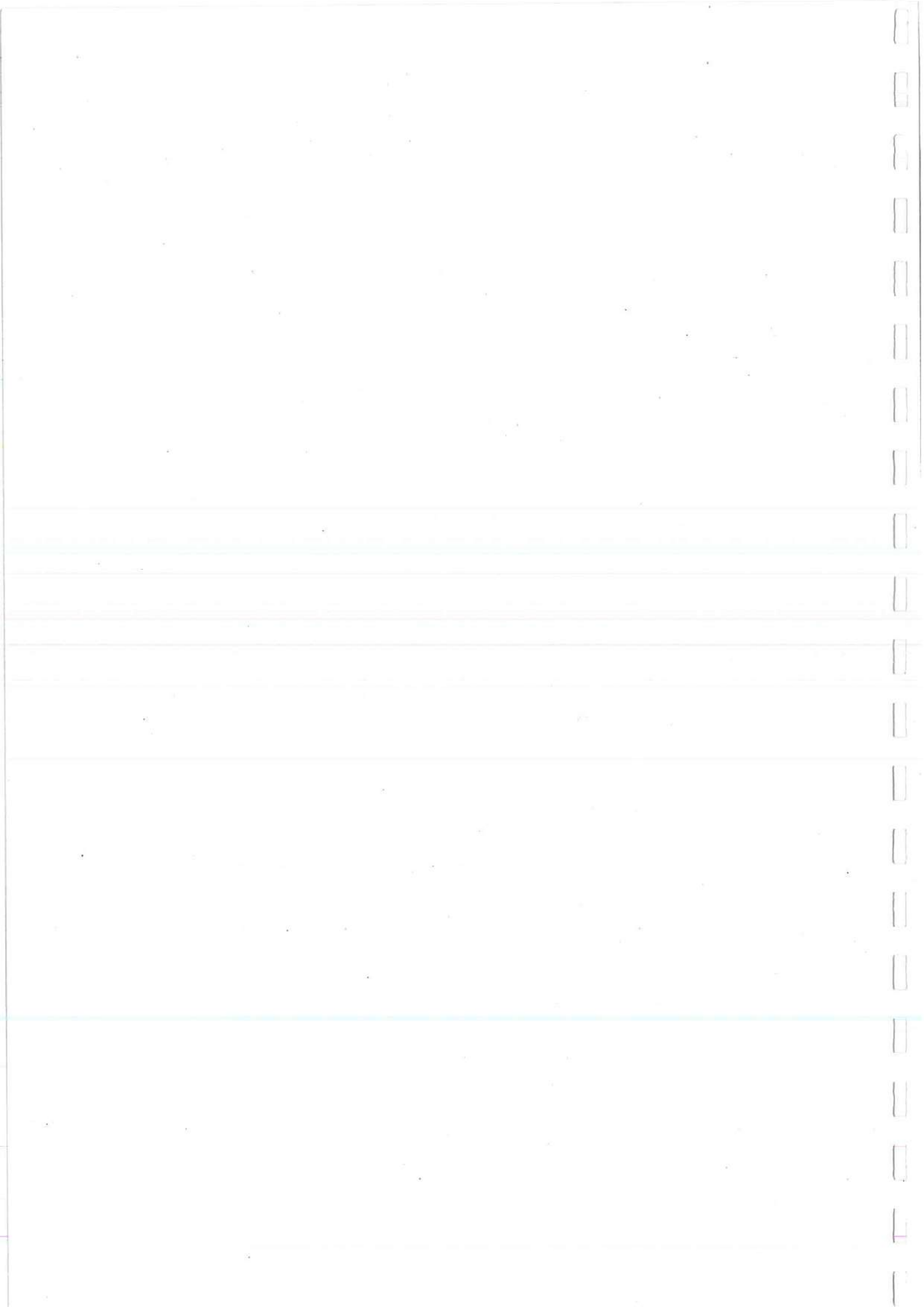


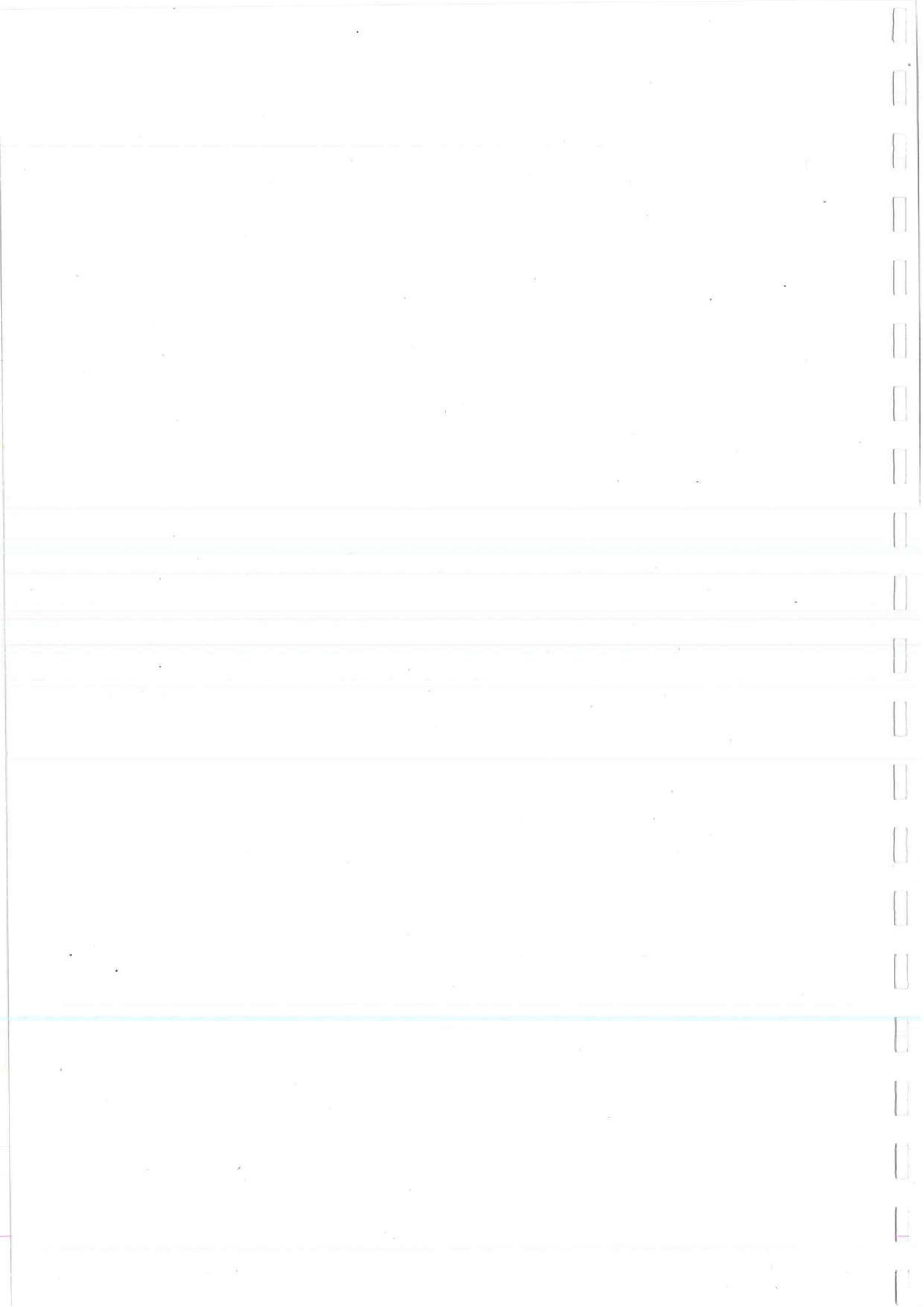


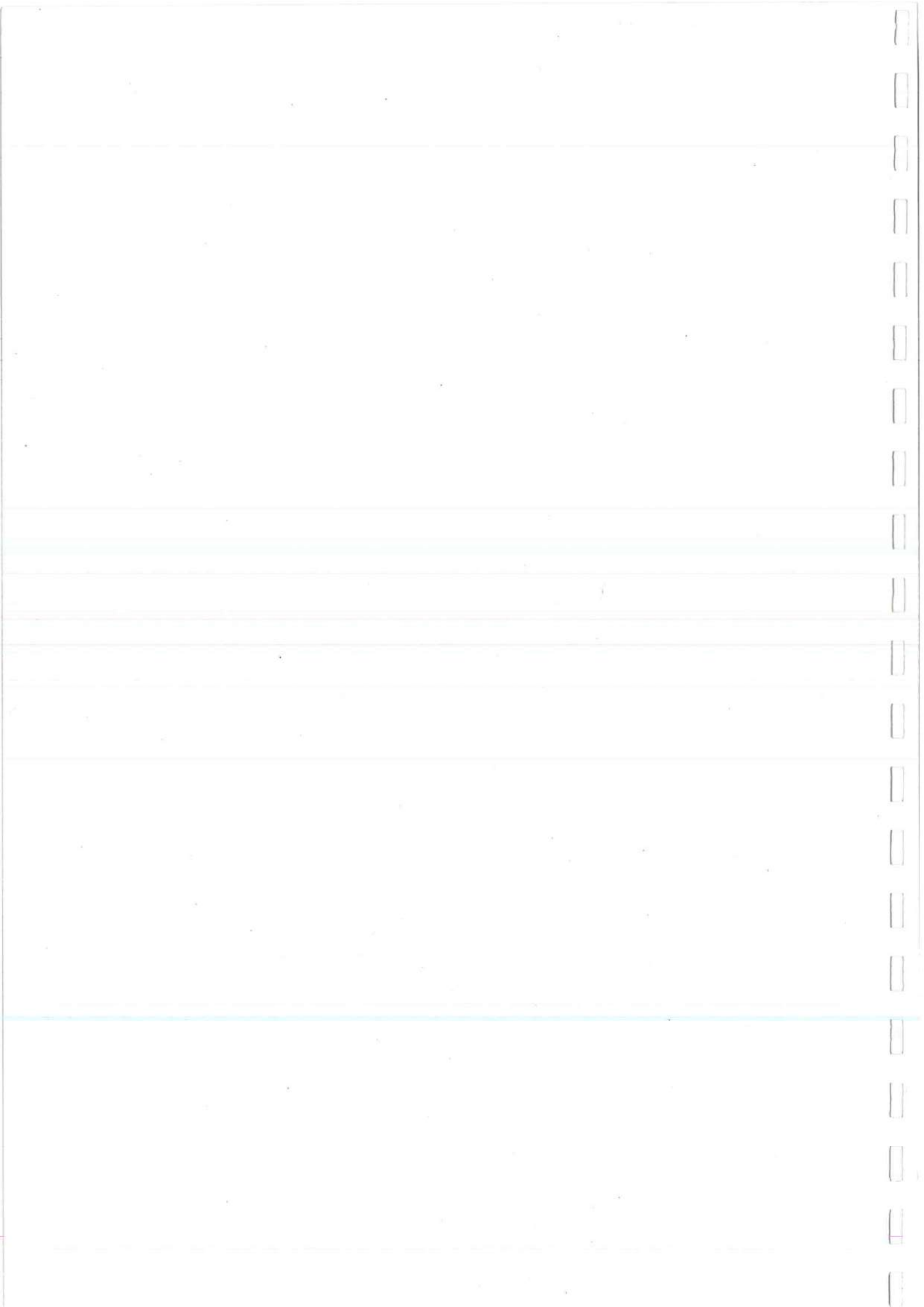








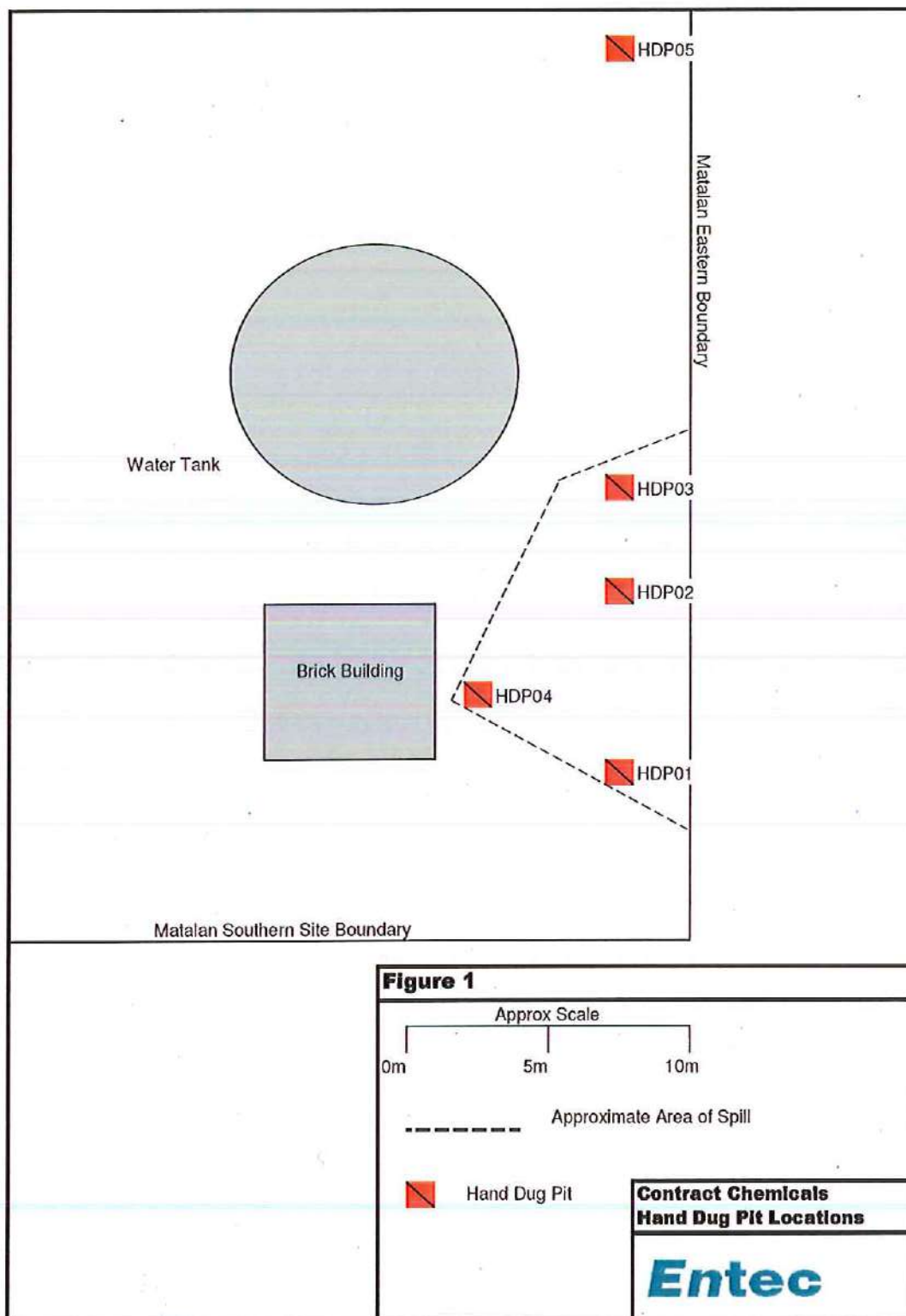


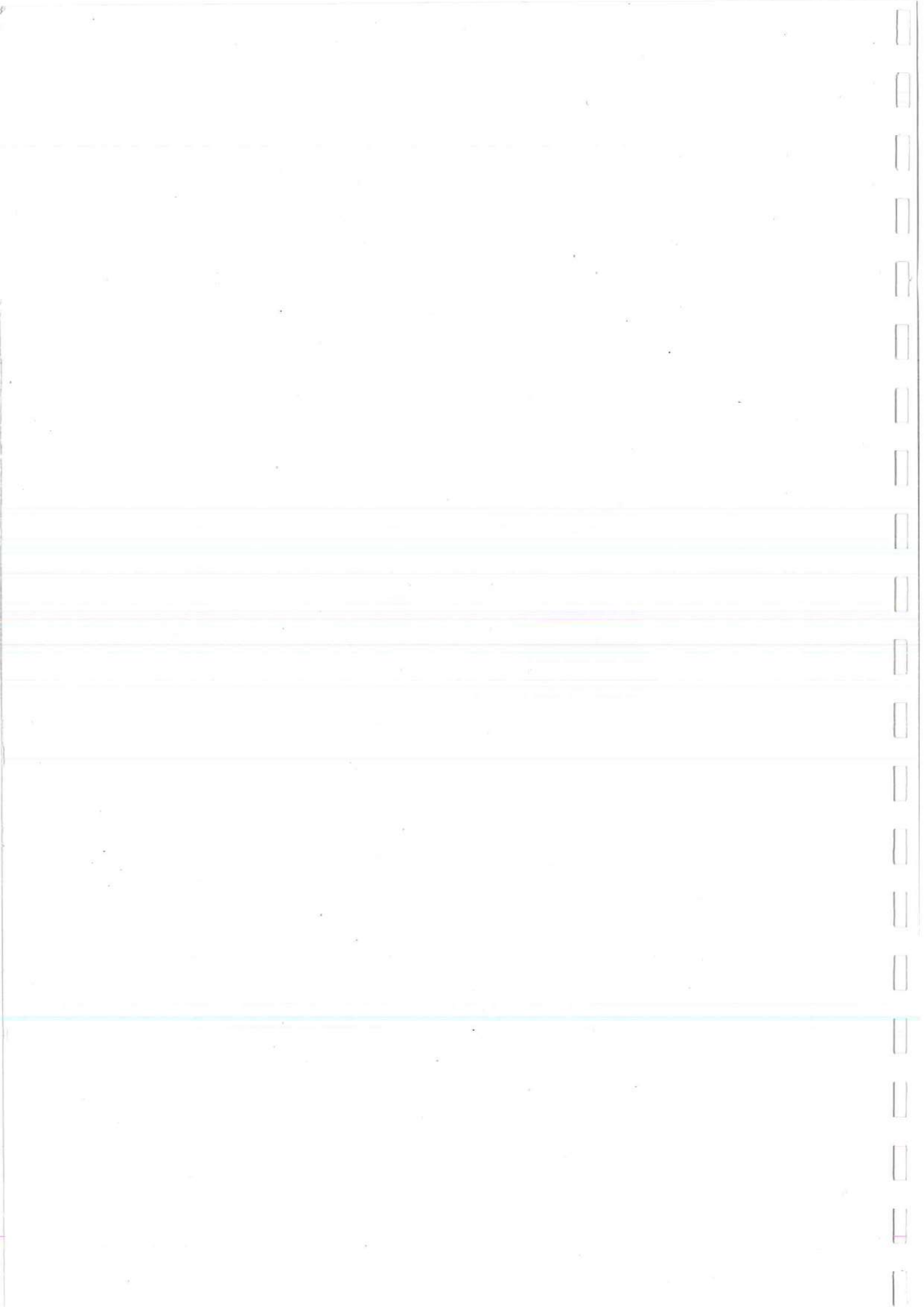


Appendix C

Exploratory Hole Location Plan

1 Page





- APPENDIX 5**
- Remediation Strategy and Verification Plan Report
 - RSVP-G&J 2025

Knowsley
Redevelopments Ltd
Former Contract
Chemicals, Knowsley

Remediation Strategy and
Verification Plan

April 2025



Document Control

Project: Former Contract Chemicals, Knowsley – Remediation Strategy and Verification Plan

Site Address: Penrhyn Road, Knowsley, L34 9HY

Client: Knowsley Redevelopments Ltd

Author: G&J Geoenvironmental Consultants Ltd

Report Reference: GJ224-03-R003-RSVP-V1

Brief Description of Contents Review of available information to develop a preliminary remediation strategy to address identified contamination. Provision of recommendations for remediation and validation works as required.

Document Checking:

Date	Issue	Comments	Prepared by:	Checked by:	Issued by:
April 2025	V1	-	Chris Hepworth Managing Director	Andrew Bedford Senior Environmental Consultant	Chris Hepworth Managing Director

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APPENDIX CONTENTS

- A** **GROUNDWATER CONTAMINATION DISTRIBUTION PLANS**
- B** **REMEDATION OPTIONS APPRAISAL**

1.0 INTRODUCTION

G&J Geoenvironmental Consultants Ltd (G&J) was commissioned by Knowsley Redevelopments Ltd to prepare this Remediation Strategy and Verification Plan to outline the works required to address contamination at the former Contract Chemicals site in Knowsley, which is proposed to be redeveloped for commercial / industrial use.

The purpose of this report is to interpret information pertaining to the site in order to develop an appropriate and sustainable remediation strategy to ensure the effective remediation of the identified contamination.

1.1 Sources of Information

Previous investigations, by G&J and others, have identified potentially significant contamination in the soil and groundwater at the site associated with the past site use, primarily in the form of 1,2-dichlorobenzene, although other contaminants are present.

A Detailed Quantitative Risk Assessment (DQRA) has been undertaken by G&J to evaluate the risks and develop appropriate remedial targets. The findings of the previous ground investigations and the DQRA are detailed in the following reports:

- '*Former Contract Chemicals Ltd, Knowsley – Interpretative Desk Study*', G&J Geoenvironmental Consultants Ltd, Report Ref: GJ224-DTS-V1, February 2021.
- '*Former Contract Chemicals Ltd, Knowsley – Site Investigation Interpretative Report*', G&J Geoenvironmental Consultants Ltd, Report Ref: GJ224-SI-INT-V1, January 2022.
- '*Former Contract Chemicals Ltd, Knowsley – Detailed Quantitative Risk Assessment*', G&J Geoenvironmental Consultants Ltd, Report Ref: GJ224-03-R002-V1, April 2025.

The desk study included a review of a number of previous ground investigations that were undertaken at the site between 1993 and 2012. The findings are described in the following reports;

- '*Preliminary Contaminated Site Investigation Contract Chemicals Ltd, Knowsley*', Cremer & Warner Ltd, Report ref: C397/1, April 1993.
- '*Integrated Pollution Prevention and Control, Pre-Authorisation Desk Study of Contract Chemicals Ltd*', AIG Consultants Ltd, Report ref: UK99/A1421, July 1999.

- *'Contract Chemicals Ltd, Trade Effluent Overspill Sampling, Final Interpretive Report'*, Entec Uk Limited, Report ref: 11002il, January 2011.
- *'Bromododecane Spillage Investigation, Contract Chemicals Site, Knowsley'*, AMEC Environment & Infrastructure UK Limite, Report ref: 32144, September 2012.

1.2 Scope of Works

The scope of this report is as follows:

- To summarise general site information such as location, environmental setting, ground conditions and contamination status, based on the results of the previous investigations;
- To assess viable remediation options to be protective of human health and the water environment;
- To provide viable and feasible remedial options that are most appropriate given the site constraints and opportunities;
- To provide an outline Remediation Implementation Plan for the site (including suggested remediation oversight and validation reporting protocols).

The remedial works are to be undertaken to support the future redevelopment of the site, based on a proposed commercial / industrial development.

1.3 Terms and Conditions

This report has been prepared for Knowsley Redevelopments Ltd in consideration of the current use of the site and the proposed future development. Much of the environmental information relates to the site in its present state and should not be used in a different context without reference to G&J.

1.4 Limitations

The findings and opinions conveyed in this report are based on the current information available to G&J. This report is based on the available information for the site and interpretative comment in terms of current contaminative status of the soil and groundwater at the site.

Although every effort has been made to ensure the accuracy of the information contained herein, no checks have been carried out to ensure the accuracy of information obtained from and collated by third

parties and no liability can be accepted for any errors or misinterpretation of the third party information where it has been incorporated into this report.

Future changes in legislation and advances in current best practises or provision of more detailed design proposals or additional investigation data, may result in this report requiring review and possible further assessment after the date of issue.

1.5 Policy Context – Land Contamination

The primary legal and policy mechanisms for managing contaminated land are Part IIA of the Environmental Protection Act 1990 and the National Planning Policy Framework.

Part IIA provides a statutory definition of Contaminated Land and supporting guidance which defines how to decide whether or not land meets this definition. For land to be determined as contaminated land, the onus is on demonstrating with sufficient certainty that land is in such condition, by reasons of substances in, on or under the ground that;

- a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

Significant harm and how to determine if a significant possibility of such harm exists is defined in the statutory guidance which accompanies Part IIA. The guidance also defines **four categories** of land with respect to the risks to human health and the water environment and how the degree of risk relates to the statutory definition of contaminated land, as summarised in the following figure:

Figure 1.1 Part IIA Categories

Land Category	Human Health	Water	
1	Unacceptably high probability that Significant Harm would occur if no action taken	Strong case that a Significant Possibility of Significant Pollution exists	Part IIA Contaminated Land
2	The risks are sufficient that a Significant Possibility of Significant Harm exists	Of sufficient concern to present a Significant Possibility of Significant Pollution	
3	Not low risk but does not pose a Significant Possibility of Significant Harm	The risks are not sufficient to constitute Significant Possibility of Significant Pollution	Not Part IIA Contaminated Land
4	Low risk to human health and no possibility of meeting the statutory definition	No/low risk to controlled waters and would not meet the statutory definition	

In terms of planning policy, a precautionary approach is adopted whereby it is necessary to demonstrate with sufficient confidence that the site cannot meet the statutory definition of contaminated land. Although the above categorisation is not explicitly applicable to planning decisions, a site classed as Category 4 should be considered suitable for development in accordance with planning policy. While a Category 3 site could be considered suitable, the reduced level of confidence associated with such a site means this is less likely.

2.0 SITE SETTING

2.1 Site Location and Description

The site is located off Penrhyn Road, Knowsley, approximately 1km east of Junction 4 of the M57 motorway. The site is approximately centred on National Grid Reference 342970, 396725; the site location and current layout are shown in Figure 2.1.

Figure 2.1 Site Location and Layout



Contains Ordnance Survey data, © Crown copyright 2025

2.2 Site Description

The site covers an area of approximately 3.5ha and is approximately rectangular in shape. Prior to the demolition and clearance works the central and eastern portions of the site comprised disused chemical processing plants and tank farms, with warehousing and storage in the west and office space and car parking in the south. The details of the former layout and specific features are presented in G&J's previous desk study (and summarised in Section 2.3, below).

The site has now been cleared and comprises predominantly rough open ground, with stockpiles of crushed demolition rubble. Some of the site roads remain in place.

The site slopes very gently down to the south, with ground levels of approximately 32mAOD in the north and 30mAOD in the south, a gradient of approximately 1 in 90.

To the immediate north of the site is the embanked A580 'East Lancashire Road' with the Brintonwood Trading Estate beyond. The southern boundary is formed by Penrhyn Road, with an area of rough ground beyond. To the west of the site is a distribution warehouse where a number of businesses operate. To the east is a chemical works operated by Algal Omega 3 Ltd, including an electricity sub-station.

2.3 Site History

The site was largely undeveloped agricultural land/rough ground until around 1980, when development of the current site commenced. Knowsley Brook was shown to run east to west across the site but was culverted when the site was developed. Since then the site has seen some development between 1988 and 2003, the most significant being the construction of a building (the Bonner building) in 1997.

Anecdotal evidence suggests that during the Second World War period the site was occupied by Nissan Hut accommodation for workers at the Royal Ordnance Factory Kirby, which was located to the north of the A580.

The history as a chemical works and the wide variety of chemicals and processes used during its operation resulted in several potential contamination sources. The most prominent of these were the main processing areas such as the Surfactant Hall, Bonner building, Diol Plant, Technical Development Centre (TDC) and adjacent tank farms. In addition, other sources such as fuel tanks, electricity substations, IBCs and smaller chemical containers were identified during the site walkover.

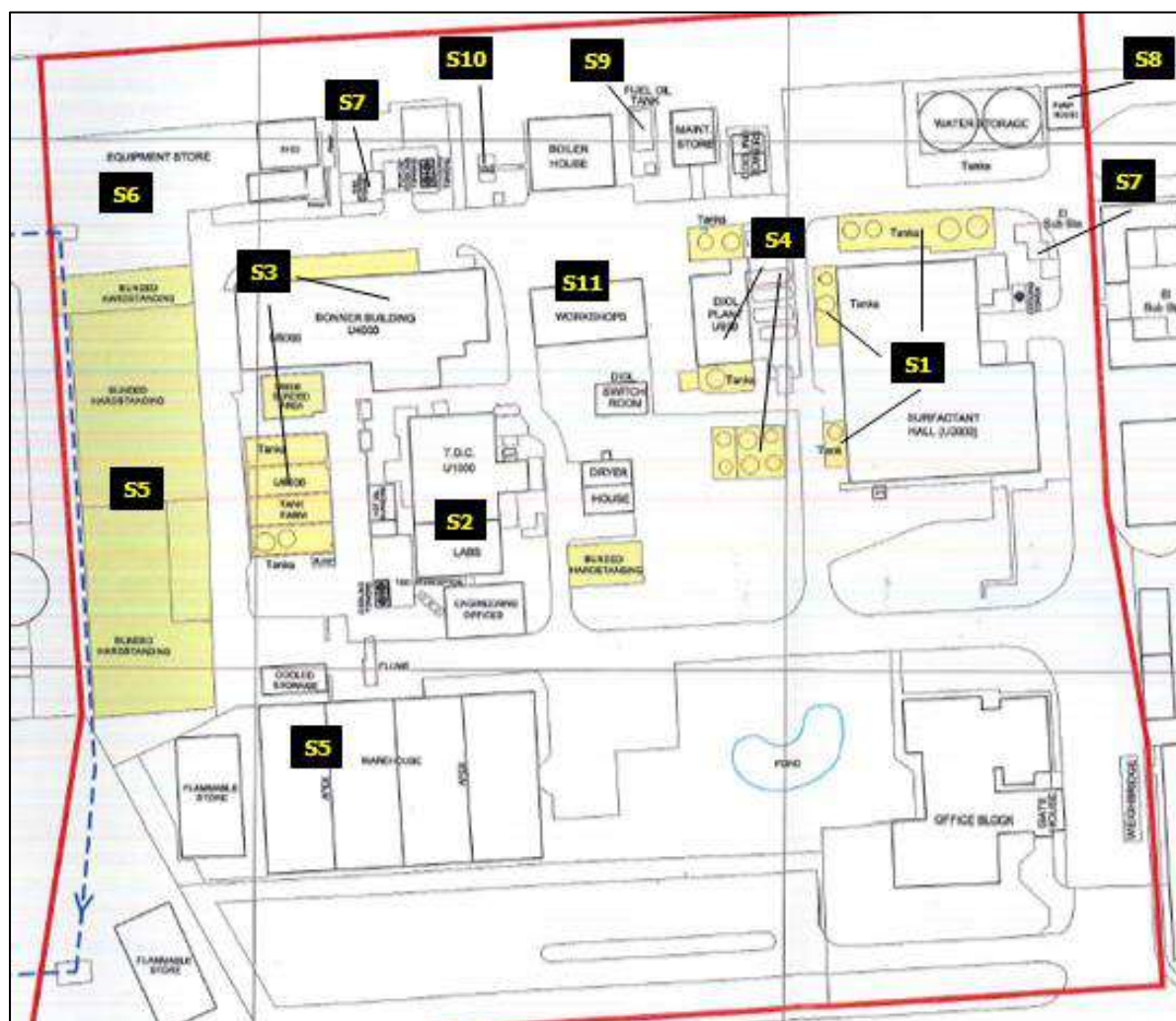
Table 2.1 presents a summary of the main potential sources and the primary contaminants of concern associated with each. Figure 2.2 is a plan of the former works and shows the locations of these sources.

Table 2.1 Summary of Main Potential Contaminant Sources

Source	Potential Contaminants
Surfactant Hall and Tank Farm (S1)	Sodium cyanate; Sodium thiocyanate; Hydrochloric Acid; Acetic Acid
Technical Development Centre (TDC) (S2)	Various organic and inorganic contaminants
Bonner Building and Tank Farm (S3)	Bromine; Butyric acid; Hydrochloric acid; Ethanol
Diol Plant and Tank Farm (S4)	Dimethyl amine (1, 2) propane diol; Hydrochloric Acid; Sodium Hydroxide

Source	Potential Contaminants
Warehouse & Bunded Hardstanding (west) (S5)	Hydrochloric acid wastes; Hydrobromine acid wastes; Sulphur Dioxide absorber waste; Alkaline wastes; Solvent wastes; Diol wastes; Ammonium Sulphate wastes
Equipment Store (S6)	Hydrocarbons; Inorganics
Substations (S7)	Hydrocarbons (including PCBs)
Pump House (S8)	Biocides; Bromgard 420 (zinc based water hardness treatment)
Fuel Tanks (S9)	Fuel Oils; Petroleum Hydrocarbons
Valve House (S10)	Gas Condensates
Workshops (S11)	Petroleum Hydrocarbons
General Contaminants associated with the buildings and Made Ground (S12)	Metals; PAHs; Asbestos

Figure 2.2 Main Potential Contaminant Source Locations



2.4 Geology and Hydrogeology

The site is shown to be underlain by Devensian Till in the north and the Shirdley Hill Sand Formation in the south, and then a bedrock consisting of the sandstone of the Chester Formation. A surficial layer of Made Ground is anticipated due to the past uses and development of the site.

The Shirdley Hill Sand Formation is classed as Secondary (A) Aquifer by the Environment Agency (EA), and the Devensian Till deposits as a Secondary (undifferentiated) Aquifer. The underlying Chester Formation is classed as Principal Aquifer. The site is within Zone 3 (total catchment) of a Groundwater Source Protection Zone. The closest active groundwater abstraction is a potable abstraction approximately 980m to the east of site, where water is taken from a number of boreholes. Another potable abstraction is present approximately 2km to the west.

The G&J investigation found Made Ground throughout the site to depths of between 0.4m and 3.0mbgl, but typically between 1.0m and 2.0mbgl. The material typically comprised reworked natural soils, with entrained man-made materials such as brick and concrete fragments, and was predominantly cohesive, although granular horizons were also present. Organic odours were noted in some locations within the Made Ground.

Beneath the Made Ground, predominantly cohesive deposits considered to be Glacial Till were encountered with thicknesses from 0.3m to >4.75m where present (Glacial Till was not recorded in several locations, predominantly in the north-east of the site).

Beneath the Glacial Till, or directly beneath the Made Ground where the Till was absent, strata considered to represent the Chester Formation were encountered, at depths of between 0.4m and 6.5mbgl. Both sandstone and mudstone were encountered, with the weathered strata being both granular and cohesive.

Perched groundwater was encountered within the Made Ground / Glacial Till, generally as minor seepages. The surface of the deeper groundwater within the Chester Formation was recorded at between approximately 1.0 – 5.5mbgl. The highest groundwater levels were recorded close to the centre of the site, from where flow appears to be strongly towards the south-west, and to a lesser degree to the north. Regional groundwater flow is expected to be towards the west, but locally this may be affected by the potable groundwater abstraction to the east of the site.

2.5 Hydrology

Knowsley Brook is understood to flow within a culvert beneath the site, having historically flowed east to west at the surface across the site. Available plans show the culvert to run beneath the western

margin of the site, while anecdotal evidence suggests it flows beneath the northern and western edges of the site.

2.6 Proposed Development

It is proposed to redevelop the site for commercial use, as shown in the potential layout in Figure 2.3.

Figure 2.3 Proposed Development Layout



3.0 CONCEPTUAL SITE MODEL

The contamination identified during the ground investigations is described in detail in the G&J Ground Investigation and DQRA reports referenced in Section 1.1. The following is a summary of the main contamination sources identified in soil and groundwater.

3.1 Sources

Potentially significant contamination has been recorded in both soil and groundwater.

3.1.1 Soil

During the investigation works, organic odours were noted in a number of locations, generally associated with the Made Ground within the former process area, which covers much of the northern half of the site. However, while contamination has been identified within the soil from a number of organic compounds, none of the recorded concentrations were above the human health GAC for a commercial land use (although it should be noted that for many contaminants the commercial GACs represent very high concentrations, and obvious odours / staining can be present without the GAC being exceeded). Therefore, the risks from soil contamination are considered only in terms of the potential impact on the groundwater (although there remains potential for concentrations above the GAC to be encountered during future works).

As such, at this stage, the only contaminant of concern in the soil is considered to be **1,2-dichlorobenzene**, as this has been recorded at significant concentrations in both the soil and groundwater. While other contaminants have been recorded at significant concentrations in the soil (e.g. 1,2,4-trimethylbenzene), they have not been recorded in the groundwater.

1,2-dichlorobenzene has been found to be widespread in the soil, having been detected in 25 out of 30 samples tested over the course of both phases of investigation, although primarily at low concentrations.

3.1.2 Groundwater Contamination

Contamination has been identified in both the shallow groundwater within the Made Ground and cohesive superficial deposits, and in the deeper groundwater within the Chester Formation. Although the groundwater may be considered a receptor (or pathway) rather than a source of contamination, the aim is to ensure that the contamination does not present an ongoing risk to the wider water environment, such as the Chester Formation Principal Aquifer and the nearby potable water abstractions.

Again, the most notable contaminant is 1,2-dichlorobezene which was recorded at its highest concentration in the deep groundwater from the centre of the site but was generally more widespread in the shallow groundwater.

While other organic contaminants have been identified, they are generally either at low concentrations and / or very localised, or are otherwise only associated with the elevated concentrations of 1,2-dichlorobenzene. The only possible exception is chlorobenzene, which was recorded at its highest concentration in a location (GJR04) where the concentration of 1,2-dichlorobenzene was much lower.

Cyanide and bromide have both been identified at significant concentrations in both the shallow and deep groundwater, but these are generally localised.

3.1.3 Contaminants of Concern

Based on the findings of the 2021 ground investigation and the supplementary investigation works undertaken as part of the DQRA, the following table details what are considered to be the primary contaminants of concern, and whether they are considered to represent a potential risk to human health and / or the water environment.

Table 3.1 Contaminants of Concern

Substance	Potential Risk to Human Health?	Potential Risk to Controlled Waters?
1,2-dichlorobenzene	No*	Yes
chlorobenzene	No*	Yes
Cyanide	No	Yes
Bromide	No	Yes

*based on a commercial land use

Table 3.2 presents a high level summary of the distribution of the above contaminants in soil (where relevant) and groundwater, in terms of maximum and average concentrations over both phases of investigation by G&J. With regards groundwater contamination, the summary is based on results from all the boreholes (both shallow and deep), again over both phases of investigation.

Table 3.2 Summary Distribution of Contaminants of Concern

Substance	Summary of soil concentrations (mg/kg)				Summary of Groundwater Concentrations (ug/l)			
	Max	Mean*	Median	No of locations detected (out of /X)	Max	Mean*	Median	No of locations detected (out of /X)
1,2-dichlorobenzene	512	19	0.051	25/30	62490	3729	25	20/27
Chlorobenzene	0.1	N/A	<0.005	8/30	9583	485	<5	11/27
Cyanide	ND	ND	ND	0/30	250	N/A	<5	8/27
Bromide	No tests			-	500	80	28	17/17

*Where results are below the LoD, a figure of 0.5 x LoD is used in the calculation of the mean

ND-Not Detected. **N/A**-Insufficient data

Table 3.2 gives a high-level overview of the distribution of the contaminants of concern and their overall concentrations. 1,2-dichlorobenzene is shown to be commonly present throughout the soil and groundwater, although in the majority of locations this is at low concentrations. Chlorobenzene is present in only very low concentrations in soil and in only in localised significant concentrations in groundwater.

Cyanide is not present at all in the soil, but has been detected in approximately one-third of the groundwater samples, while bromide is present in all groundwater samples (although low concentrations may be naturally expected).

The plans in Appendix A show the distribution within the groundwater of 1,2-dichlorobenzene, chlorobenzene and bromide.

3.2 Receptors

3.2.1 Human Health

In terms of human health, the receptors will be the users of the remediated site. It is proposed to redevelop the site for commercial / industrial use, so the receptors will be employees and visitors to the site.

Those involved in any remediation, earthworks and / or construction would also be potential receptors for the identified contamination. However, such risks would usually be managed in accordance with appropriate health and safety risk assessments and the use of suitable work procedures and personal protective equipment (PPE).

3.2.2 Controlled Waters

There are considered to be two controlled waters receptors that are relevant in terms of potential impact from contamination originating on the site. Firstly, there is the underlying groundwater, represented by the Secondary Aquifer(s) of the superficial Shirdley Hill Sand Formation and the Devensian Till, and more significantly by the Principal Aquifer of the Chester Formation. Secondly, there is Knowsley Brook, which is understood to flow within a culvert beneath the site.

The most sensitive controlled waters receptor is considered to be the groundwater within the Chester Formation, which is present at depths of around 3-5mbgl beneath the site. There are specific receptors in the form of potable groundwater abstractions, which take water from the Chester Formation approximately 1km to the east and 2km to the west.

The shallow groundwater which has been identified within the Made Ground and superficial deposits may be considered to be a contaminant pathway rather than a receptor in its own right, given that it has no resource potential.

Knowsley Brook is likely to be largely isolated from the groundwater by the culvert in which it flows, and it may be located above the water table (although the depth of the culvert is not currently known).

The groundwater table associated with the Chester Formation aquifer has been monitored at a level between approximately 1 – 5.5mbgl, although is considered to be confined beneath the overlying cohesive deposits in some areas. These deposits will provide some protection, but the presence of contaminants within the Chester Formation aquifer suggests it is not completely hydraulically isolated from the shallow groundwater.

3.3 Contaminant Pathways

Contamination has been identified within both the soil (primarily the Made Ground) and the groundwater. As such, the pathways described below could potentially link the contamination sources with the receptors.

3.3.1 Site Users (Human Health)

The active pathways for the exposure of site users will likely comprise the following, based on the proposed site use;

- Direct contact with contaminated soils, followed by ingestion and / or dermal absorption;
- Inhalation of soil derived dusts and particulates;

- Inhalation of gases and vapours originating from contaminated soil or groundwater;
- Consumption of water supplied through pipes laid in contaminated soil.

3.3.2 Controlled Waters

- Leaching of contaminants within the Made Ground and superficial deposits, followed by migration through the unsaturated and saturated zones to the Principal Aquifer within the Chester Formation. This will likely occur via more permeable horizons in the generally cohesive Made Ground and superficial deposits;
- Migration of contamination in any shallow groundwater to the culverted Knowsley Brook and seeping through any cracks or other penetrations in the culvert;
- Migration of dissolved contamination (resulting from the above) within the Chester Formation,

3.4 Pre-Remediation Conceptual Site Model

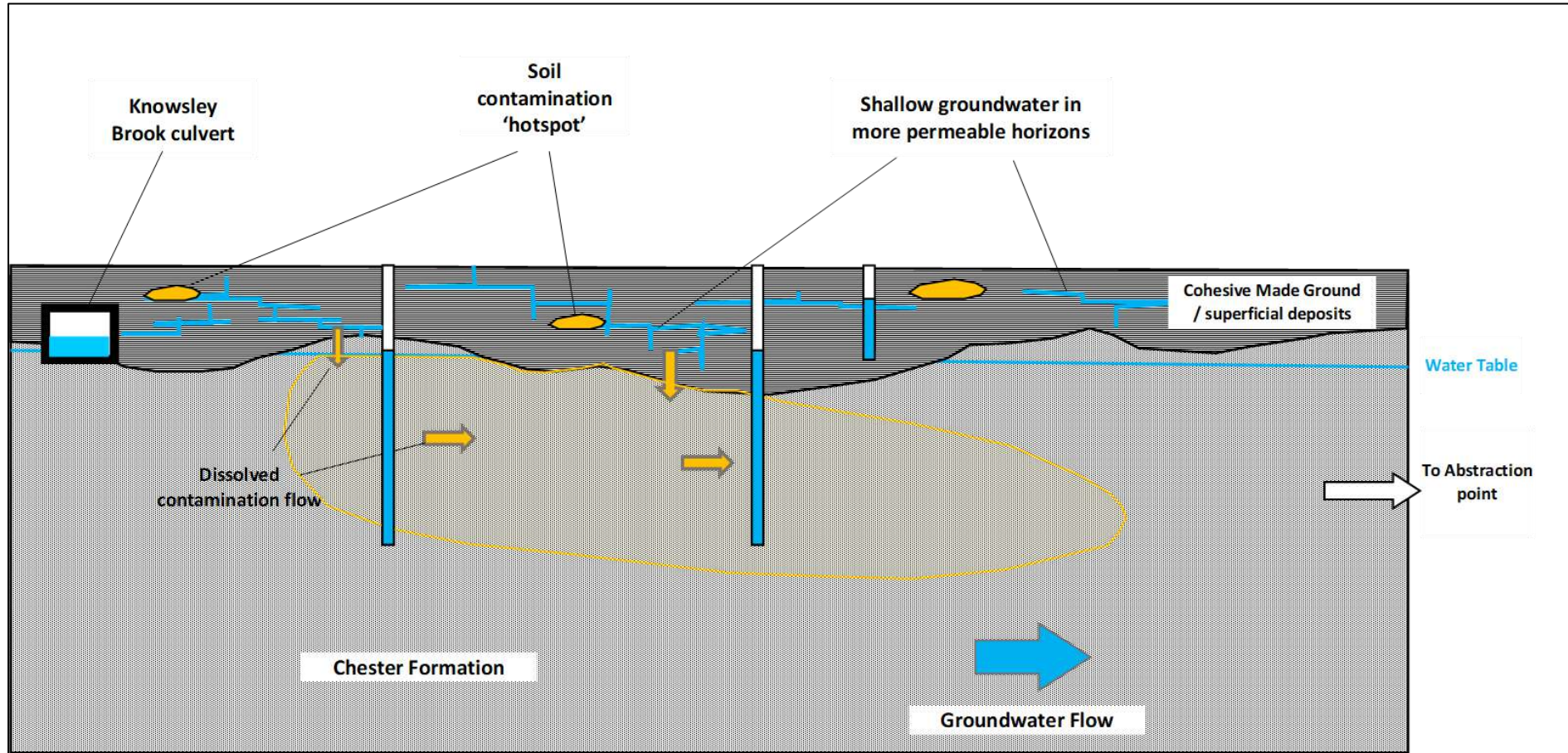
The potentially significant pollutant linkages are summarised in Table 3.3, while Figure 3.1 presents a schematic of the site ground conditions, contaminant sources, receptors and pathways based on the current site use and the information collected during the ground investigations.

Table 3.3 Pollutant Linkages

Reference	Source	Pathway	Critical Receptor
PL1*	Organic contamination, specifically 1,2-dichlorobenzene throughout the Made Ground	Ingestion	Humans (Future site users)
PL2*		Dermal Contact	
PL3*		Inhalation of soil derived dusts	
PL4*		Inhalation of vapours	
PL5		Leaching and migration via the unsaturated zone to the underlying groundwater	Chester Fromation Principal Aquifer
PL6*	Dissolved contamination within the Chester Formation (1,2-dichlorobenzene, chlorobenzene, cyanide, bromide)	Migration via saturated zone	Wider groundwater environment (Chester Formation Principal Aquifer)
PL7*			Potable Water Abstractions
PL8*#			Knowsley Brook

*PL1 to 4 not significant based on currently available information and PL6 to 8 may not be significant based on results of the DQRA. #Linkage may not be complete.

Figure 3.1 Conceptual Site Model



4.0 REMEDIAL TARGETS AND OBJECTIVES

4.1 Remedial Targets

Remedial targets have been derived for the main contaminants of concern which are protective of human health and the water environment. The details of how the targets were derived are provided in the DQRA report. The targets are designed to ensure future users of the site are not exposed to unacceptable levels of contamination and that there are no unacceptable risks to the water environment (specifically the potable water abstractions and the wider Chester Formation Principal). The human health targets are based on Generic Assessment Criteria for a commercial land use.

4.1.1 Soil Remedial Targets

No contaminants have so far been recorded at concentrations in the soil that are in excess of the human health GAC for a commercial land use. The only contaminant of concern identified in the soil was 1,2-dichlorobenzene, as this was the only contaminant that was present at significant concentrations in both the soil and groundwater. However, GAC / benchmark concentrations are included for other organic contaminants that have been found to be present, but so far not at concentrations that would be considered to present a significant risk.

The remedial targets for soil are detailed in Table 4.1.

Table 4.1 Soil Remedial Targets and Benchmark Concentrations

Substance	Human Health Targets - Commercial GAC (mg/kg)	Controlled Waters Targets (mg/kg)	
		Remedial Target Derived Using Consim	Maximum Recorded Concentration*
1,2-dichlorobenzene	2000	41	512
chlorobenzene	56	-	0.1
1,2,4-trimethylbenzene	42	-	5.7
1,3,5-trimethylbenzene	-	-	1.3
n-propylbenzene	4100	-	0.6
Toluene	56000	-	0.11
Ethylbenzene	5700	-	0.25
p-&m-xylene	5900	-	0.49
o-xylene	6600	-	0.30
Bromoform	760	-	0.9
Organic Contamination	Absence of evidence of significant organic contamination, such as free phase contamination, heavy staining or strong odours		

*to be used as a benchmark to determine if further assessment of the risks to the water environment is required
Bold are anticipated targets for remediation works based on the current information

Based on currently available information, the main drivers of the remediation works in terms of soil contamination are ensuring concentrations of 1,2-dichlorobenzene are below the remedial target of 41mg/kg and that any significant visual or olfactory evidence of contamination is addressed.

All contaminants have been recorded at concentrations that are well below the GAC for a commercial land use, and it is considered unlikely that concentrations exceeding the GAC will be encountered during the remediation and verification works.

Table 4.1 includes the maximum recorded concentrations of the most significant organic contaminants identified during the previous investigation works. These are not remedial targets, but it is suggested that these concentrations are used as an initial benchmark to determine if any further assessment is required of the risks to controlled waters. In reality, a potential risk is only likely to be present if the verification works identify much higher concentrations. As **chlorobenzene** was the only one of these contaminants (other than 1,2-dichlorobenzene) to be recorded at significant concentrations in the groundwater, then this is realistically the only contaminant that will require any further assessment should it be encountered at significantly higher concentrations than it has been previously.

4.1.2 Groundwater Remedial Targets

The DQRA did not determine any site-specific remedial target concentrations for groundwater that are protective of the wider water environment, as the assessment concluded that the identified contaminants in groundwater (specifically 1,2-dichlorobenzene, chlorobenzene, cyanide and bromide) will not present a significant risk to the wider groundwater with no impact predicted for the nearby abstraction points.

Remediation of soil sources and natural attenuation processes, such as dilution, dispersion and degradation should result in improvement in groundwater over time. As such, the following target is therefore considered appropriate for groundwater contamination;

- As a minimum, no observed increase in concentrations or expansion of the plume(s), but with an overall aim for betterment (i.e. reduced concentrations and a declining plume).

4.2 Remedial Objectives

The overall objective is to ensure that none of the Pollutant Linkages detailed in Table 3.3. are complete after remediation. Remediation works should be undertaken at the site to ensure that concentrations of the contaminants of concern are below levels that would represent a risk to human health or controlled waters (i.e. the sources are eliminated), with reference to the remedial targets detailed above.

Remediation works should aim to achieve the soil remedial targets and to demonstrate that contamination in groundwater is improving, or at the very least not deteriorating.

5.0 REMEDIATION OPTIONS APPRAISAL

5.1 Introduction

The aim of the remediation options appraisal is to assess technologies, processes and design measures available that have the potential to address the primary soil sources and, where practical, existing groundwater contamination in accordance with remedial objectives described above, given what is known regarding the ground conditions and any constraints associated with the site layout and setting.

The available remedial options have been considered with the objective of:

- Providing certainty that the remediation solution meets the remedial criteria for the site;
- Providing a pragmatic and sustainable remedial option;
- Providing an economical and viable remedial solution.

The remedial options appraisal will be assessed in terms of addressing the relevant pollutant linkages detailed in Table 3.3, which currently represent a potentially unacceptable risk.

Given the past site use, the intensity of the previous investigations and the presence of large stockpiles preventing access to some areas, the presence of previously unidentified contamination hotspots is considered likely and verification of soils across the site is therefore considered necessary. Verification inspection, sampling and analysis is described in Section 7.

5.2 Remedial Technical Assessment Process

A remediation options appraisal has been carried out to determine the most appropriate remedial solution. The appraisal consisted of the following key stages:

- An initial identification of available and feasible technologies for use at the site;
- An evaluation of the suitability of technologies to meet remedial objectives;
- A summary of technologies or combination of technologies that are considered suitable for the site.

5.3 Remediation Outline Assessment

The purpose of this section is to identify technologies which are feasible for the remediation of the identified contamination sources at the site and consistent with the remedial objectives. The following

treatments and treatment combinations currently available in the United Kingdom are considered to be suitable for the geological and hydrogeological conditions of the site and the nature of the contamination:

- Segregation of affected soils / materials;
- Off-site Treatment at a Soil Treatment Facility;
- Off-site Disposal;
- Ex-situ Bioremediation;
- Soil Vapour Extraction;
- In-situ Chemical Reduction / Oxidation;
- In-Ground Barriers;
- Pump and treat / dispose;
- Natural Attenuation;

5.3.1 Segregation of Affected Soils / Materials

The separation of soils affected by contamination from those that are suitable for use and / or the separation of deleterious materials.

Advantages: Prevents suitable soils from being excavated for treatment or disposal; Considered a form of pre-treatment in terms of waste disposal; Reduces disposal costs.

Disadvantages: Only suitable for identifiable 'hotspots' of contamination or obvious deleterious materials, such as visible fragments of asbestos containing materials.

5.3.2 Off-site Treatment at a Soil Treatment Facility

Excavation of soils impacted by contamination, followed by removal from site for treatment at an off-site facility.

Advantages: Absolute removal of all contaminated material; Rapid timescales; Avoids the need to handle large volumes of soil on-site; Cheaper than landfill.

Disadvantages: Moderately costly; Generates local traffic; Requires import of clean fill material.

5.3.3 Off-site disposal of soils

Excavation of soils impacted by contamination, followed by removal from site for disposal at an appropriately licensed waste management facility (e.g. landfill).

Advantages: Absolute removal of all contaminated material; Rapid timescales.

Disadvantages: Extremely costly; Generates local traffic; Requires import of an equivalent quantity of “clean” fill material; Not sustainable due to large amount of lorry movements; Not considered best practice by regulators.

5.3.4 Ex-situ Bioremediation

Bioremediation processes may be operated under aerobic and/or anaerobic conditions to restore contaminated soils to a state suitable for use. Excavated soil is placed in an above ground treatment area and stimulated to enhance the natural biodegradation by exploiting the ability of soil microbial populations to biodegrade or biotransform contaminants present in the soil.

Advantages: Easy to monitor; Effective with most organic contaminants; Cost effective; Sustainable; Improves soil structure.

Disadvantages: Requires large treatment area; May not be suitable for all organic contaminants; Can be a relatively slow process; Soils with high clay / silt content can be difficult to treat.

5.3.5 Soil Vapour Extraction

Soil vapour extraction (SVE) is used to remove volatile and some semi-volatile contaminants from soil. A vacuum is applied to the soil which in turn induces a controlled flow of air driving off more volatile contaminants in the soil phase. Membranes are usually placed over the surface of the soil treatment beds to increase the effectiveness of treatment. The off-gases will usually be treated to recover or destroy the contaminant.

Advantages: Removes halogenated and non-halogenated organic compounds; Can be tailored to maximise VOC removal; Sustainable.

Disadvantages: Requires large treatment area; Relatively slow process; Moderately expensive; Off gas treatment may require special permits for operation in built up areas; Ineffective for less volatile contaminants.

5.3.6 In Situ Chemical Oxidation / Reduction

Chemical Oxidation / Reduction involves introducing substances to groundwater that destroy or transform contaminants or enhance microbial degradation. For example, zero valent iron can drive reductive dechlorination, while various oxidants can drive degradation of chlorinated solvents, BTEX and fuel oils.

Advantages: Effective on suitable organic source zones; Sustainable;

Disadvantages: Expensive when employed over large areas; Relatively slow process; Groundwater treatment may not offer significant benefits given results of DQRA.

5.3.7 In Ground Barriers

In ground barriers can take the form of impermeable walls formed in the ground to prevent the migration of contaminated groundwater, or permeable barriers that allow contaminated groundwater through, but which contain a reactant that removes or immobilises the contaminants from the groundwater.

Advantages: Relatively simple to implement; PRBs can treat a variety of contaminants depending on the reactant.

Disadvantages: Ongoing maintenance required; High initial costs; Large volumes of soil require disposal or re-use; Generally need an impermeable strata to key into; PRBs may need replacement; Physical barriers do not treat contamination; Benefits may be limited given results of DQRA.

5.3.8 Pump and Treat / Dispose

Removal of contaminated groundwater by pumping from extraction wells or open trenches / excavations. Once removed, the groundwater undergoes treatment before being discharged to a sewer, watercourse or back to ground, or is taken off-site for disposal.

Advantages: Easy to monitor; Can be used in conjunction with soil treatments which involve excavations; Removes all contaminants; Cost-effective;

Disadvantages: Requires disposal or treatment of extracted groundwater; Rate of progress depends on recharge rate and volume of groundwater / product; Extracting from depth requires detailed plume / source characterisation and numerous extraction wells.

5.3.9 Natural Attenuation

Natural attenuation occurs where ground conditions allow natural processes such as biodegradation, dispersion and dilution to reduce contaminant concentrations without significant intervention (usually in groundwater). This usually requires a programme of monitoring to be undertaken to demonstrate that ground conditions are conducive and that attenuation is occurring.

Advantages: Low Cost; Sustainable; No ground disturbance.

Disadvantages: Requires suitable ground conditions; Requires primary sources to be removed; Long timescales; Can require alternative technique if no progress.

5.4 Detailed Evaluation of Remedial Technologies

The preliminary remediation technologies described above have been evaluated for suitability by assessing each against the remediation objectives. A point scoring system has been adopted to provide an objective view of the evaluation. The scoring system is as follows:

- **4 Points** - Highly suitable, easily meets the remedial objectives with a high degree of certainty
- **3 Points** - Generally suitable but not necessarily the best option or some there be some uncertainty
- **2 Points** - Moderately or possibly suitable, or there may be some significant uncertainty
- **1 Point** - Unsuitable or high degree of uncertainty regarding suitability
- **0 Points** - Very unsuitable or contrary to objective

A table showing the detailed options appraisal is available in Appendix B.

5.5 Preferred Remediation Solution for the Site

Based on the results of the options appraisal, the preferred remedial solution uses the following technologies to treat the identified soil and groundwater contamination, as follows;

1. Selective excavation, segregation and ex-situ bioremediation of soils affected by significant organic contamination, most notably from 1,2-dichlorobenzene (to address Pollutant Linkages PL5 and possibly PL1 to PL4 (Table 3.3));

2. Pumping of any contaminated shallow groundwater from excavations (where encountered) for treatment and / or disposal (indirectly address PL6 to PL8);
3. Monitoring of attenuation of groundwater as a result of the remediation works and natural processes (PL6 to PL8);

The above options are considered the most appropriate based on the options appraisal detailed in Appendix B. These options are considered the most appropriate in terms of cost and sustainability to address the contamination identified at the site, given the site constraints and opportunities, and the identified risks.

5.5.1 Soil Remediation

Excavation and bioremediation is considered appropriate to address localised areas of organic contamination, which should be susceptible to bioremediation processes. The affected soils will be identified through olfactory and visual evidence of contamination and the results of laboratory analysis undertaken as part of a robust programme of inspection and verification (see Section 7.1). The two areas of significant contamination identified during the previous investigation works will be considered as 'hotspots' and addressed during the remediation works. These areas are centred on the investigation positions detailed below and their locations shown in Figure 5.1.

- BH104 (342900E -396738N) – 1,2-dichlorobenzene 41mg/kg
- BH105 (343028E -396786N) – 1,2-dichlorobenzene 512mg/kg

Figure 5.1 'Hotspots' Identified by Previous SI



Although the concentration recorded in BH104 does not exceed the remedial target, it is considered to represent an area where higher concentrations may be present and therefore should be treated as a hotspot at this stage.

Other hotspots are likely to exist in locations not covered by the previous investigation works which will need to be identified and addressed through the inspection and verification programme.

5.5.2 Groundwater Remediation

Active treatment of the groundwater within the Chester Formation is not proposed at this stage, given the results of the DQRA suggest that existing groundwater contamination does not present a significant risk to the wider groundwater environment including the potable water abstractions. Groundwater treatment is considered likely to be of limited benefit when compared to costs and practicalities of undertaking such remediation works.

Any contaminated shallow groundwater (i.e. perched groundwater with the Made Ground / Glacial Deposits) will be pumped and treated / disposed of where encountered in excavations during the remediation works.

Groundwater monitoring will be undertaken (see Sections 6.4 and 7.1) to demonstrate that there is no deterioration of groundwater quality, with the overall aim of demonstrating betterment, and continues not to present a significant risk to controlled waters receptors. The removal of significant soil sources (plus pumping of any contaminated shallow groundwater), together with natural attenuation processes, should mean that no significant ongoing sources of contamination remain within the Made Ground / Glacial Deposits and that groundwater quality will improve over time.

6.0 REMEDIATION STRATEGY AND IMPLEMENTATION

6.1 Introduction

The remedial works at the site are designed to address the identified contamination and manage any associated potentially significant pollutant linkages. The following sections present an outline approach and strategy for the remedial works. The approach will need to be agreed with the regulators prior to the remedial works commencing and detailed method statements will need to be prepared by the contractor.

6.2 Remedial Targets / Criteria

Remedial target concentrations for soil are detailed in Section 4.1 and the remedial works will aim, as a minimum, to achieve these concentrations across the site.

The main aim with respect to groundwater contamination should be to prevent future deterioration and where practical provide betterment in terms of groundwater quality.

6.3 Remediation of Contaminated Soils and Groundwater

6.3.1 Soil

The soil remedial works will comprise the excavation of soils from any significant organic contamination 'hotspot' locations, identified through visual / olfactory evidence of contamination or where concentrations in validation samples are found to exceed the remedial target. The 'hotspots' will include those identified during the previous G&J investigation, as shown in Figure 5.1. The soils will be excavated until there is no obvious visual or olfactory evidence of contamination, at which point verification samples will be taken from the base and faces and the excavation.

The excavated soils displaying evidence of contamination, or from areas where laboratory testing has shown concentrations above the remedial targets, will be separated and transported to a stockpile located in a designated treatment area within the site.

Verification samples will be taken from trial pits excavated at 10m or 20m centres across the site as described in Section 7.1. Together with inspections undertaken during the trial pitting (and any other earthworks), this will ensure the Made Ground and upper Glacial Deposits are suitable for use and that contaminated soils are sent for treatment (or removed from site).

The soils affected by significant organic contamination will be transported to the treatment area and formed into windrows / biopiles. The soils will be periodically turned and nutrients added as appropriate to enhance the bioremediation process. Representative samples will be taken at regular intervals to monitor the progress of bioremediation and determine when soils are suitable for re-use.

The contractor will be responsible for determining the most appropriate frequency of turning, nutrient addition etc, required to achieve the remediation objectives, which will include undertaking any bioremediation trials as necessary. Should bioremediation prove unsuccessful, then any soils that are deemed to remain a potential risk will be removed from site for disposal, or subject to an alternative form of remediation.

Should any other obvious evidence of contamination be identified anywhere on the site during remediation or future earthworks / construction (suspicious materials, staining, odours), the affected soils / materials will be separated and characterised, and subsequently treated or disposed of.

6.3.2 Groundwater

Groundwater contamination will be addressed by removing sources of contamination in the soil, as described above, and by pumping any contaminated water from excavations for either treatment or disposal, depending on the volume.

Minor shallow groundwater is expected to be present associated with the Made Ground and natural Glacial Deposits, as was previously noted in standpipes with response zones within these strata. Where encountered, contaminated shallow groundwater will be pumped from excavations created as a result of remedial works.

Groundwater will be pumped out of the excavations, either to a treatment plant where it will be passed through appropriate filters of sand and activated carbon to remove contaminants, before being either discharged under consent to the sewer or removed from site, or to holding tank for off-site treatment / disposal.

The volume of groundwater extracted from the excavations will depend on the rate of recharge and pumping from the excavations.

6.3.3 Natural Attenuation

It is considered that natural attenuation will likely play a part in the remediation of groundwater, particularly after the soil remediation works have been completed. A programme of monitoring will be undertaken during and after the remediation works. This is to demonstrate that there continues to be

no significant risks to controlled waters receptors, and ideally that the overall groundwater quality improves after completion due to natural processes.

6.4 Monitoring Wells

Monitoring wells are required to allow ongoing monitoring of groundwater quality during and after the remediation works in order to demonstrate that the overall quality of the groundwater is improving. Where possible, existing wells will be used, but it is considered likely that some new wells will be required to replace any lost / destroyed during the remediation or other earthworks or that need to be relocated nearby due to construction activities.

There are currently 6 useable monitoring wells that target the Chester Formation. One of these (GJR03) is located close to the centre of the site, with the rest around edges, as shown in Figure 6.1. Each of these standpipes extends to approximately 12m.bgl

Figure 6.1 Standpipes within the Chester Formation



GJR03 is located close to the centre of the proposed building, and therefore it will need to be decommissioned at some point during the construction works, and there will no possibility of relocating a new standpipe nearby. GJR03 will be maintained for as long as possible, until such a time as construction works require its removal.

Monitoring will be undertaken on a monthly basis during the remediation and until 3 months after completion, and thereafter on a quarterly basis for at least 6 months.

6.4.1 Decommissioning of Standpipes

There are numerous other standpipes present of the site in addition to those shown in Figure 6.1, the majority of which are shallow and do not extend into the Chester Formation. All redundant standpipes should be decommissioned in accordance with EA guidance to ensure they do not act as preferential contaminant pathways. This also applies to the standpipes in Figure 6.1 after completion of the monitoring period if they are no longer required.

6.5 Implementation Plan

Following agreement of the remedial strategy, the contractor will need to supply method statements and all relevant documentation to stakeholders detailing the proposed implementation / phasing plan. Relevant documentation will include all relevant environmental permits, waste and treatment licences.

6.6 Materials Management Plan

A Materials Management Plan will likely need to be prepared (in accordance with the CL:AIRE document "The Definition of Waste: Development Industry Code of Practice Version 2") for the reuse of excavated materials on the site. If required, a declaration will need to be prepared by a Qualified Person to confirm that the materials are suitable for use and therefore not classified as waste.

6.7 Potential Risks to Remediation & Construction Workers

During site remediation and other works being undertaken at the site, the potential exposure to soil contaminants by site remediation and construction workers should be addressed as part of the contractor Site Specific Working Plan and within a Health and Safety Plan (HASP) for the works to be compliant with CDM requirements.

6.8 ACMs

No obvious significant ACMs were identified during the previous investigations, and it is unlikely (but not impossible) that such materials may be encountered during remediation or other earthworks.

However, all site operatives should be at least 'asbestos aware' and if any potential ACMs are encountered during future works, the works should be paused and a geo-environmental engineer or asbestos specialist consulted to determine an appropriate course of action.

Any work with ACMs must be in accordance with the Control of Asbestos Regulations 2012 and the site-specific asbestos risk assessment, and only be undertaken by personnel with appropriate training and licences, as applicable.

7.0 VERIFICATION OF THE WORKS

7.1 Verification Plan

The works will be verified in accordance with the Environment Agency document: 'Verification of Remediation of Land Contamination' (Report: SC030114/R1) and other relevant industry good practice guidance including The Environment Agency's Land Contamination Risk Management (LCRM) framework.

In summary, the following work will be undertaken on site by the geo-environmental consultant and the contractor:

- Attendance on site during the remediation works (including verification trial pitting and hotspot excavation) by an experienced geo-environmental engineer to inspect the soils, take samples, supervise excavations and maintain a site diary of activities;
- Site wide verification will be undertaken through the excavation of trial pits at a frequency of 10m centres within the former process area and 20m centres across the rest of the site (as shown in Figure 7.1, below). Trial pits will be excavated to depths of between 2.5 – 3.0m.bgl to allow identification of any obvious hotspots and the collection of representative verification samples. At least one sample will be collected from each pit;
- Samples taken from the verification trial pits will be submitted to a UKAS/MCERTS accredited laboratory and analysed for VOCs (including 1,2-dichlorobenzene and chlorobenzene);
- Verification of soil contamination hotspot excavations will be by inspection of the soils for visual and olfactory evidence of contamination, and the collection of verification samples from the base and faces of the excavation. Samples will be submitted to a UKAS/MCERTS accredited laboratory and analysed for the contaminants of concern;
- Verification samples from remedial excavations will be taken at a minimum frequency of 1 per 10 x 10m from the base and every 10m along the sides of excavations, with a minimum of one sample per face and base;
- Treated soils will be tested at a rate of one sample per 250m³, with a minimum of five samples taken from each windrow / biopile. Samples will be submitted to a UKAS/MCERTS accredited laboratory and analysed for the contaminants of concern;
- Any imported material used on the site (for example if required to achieve the desired site levels) will be tested at a rate of one sample per 250m³ for the first 5000m³ reducing to 1

sample per 500m³ thereafter if materials are reasonably consistent. A minimum of three samples will be taken from each different soil source. Samples will be analysed for a full suite of contaminants that will include, as a minimum: metals, pH, asbestos, PAHs, Petroleum Hydrocarbons, plus any others that may be relevant based on the source of the material;

- All samples will be screened against the remedial targets for the site, or otherwise Generic Assessment Criteria for a commercial land use, and there should be an absence of any visual or olfactory evidence of contamination;
- A topographic record will be kept by the contractor, as appropriate, to show the excavations locations and depths;
- A photographic record and description of the excavations will be kept by the geo-environmental engineer / contractor;
- The volume and locations of contaminated soils excavated, treated, disposed and re-used will be carefully recorded by the contractor, along with all other material movements;
- The volume of water removed from the excavations, treated and discharged / tankered off-site will be recorded by the contractor;
- Samples of groundwater will be taken from the monitoring wells and submitted to a UKAS/MCERTS accredited laboratory and analysed for cyanide, bromide and VOCs;

Figure 7.1 Verification Sampling Frequencies



7.2 Verification Report

A post remediation verification report will be produced in line with LCRM and other relevant contaminated land guidance. It will contain all site data including analysis results, approvals, licences and drawings to show the effectiveness of the remediation.

The verification report will include the following information:

- Details of the objectives for the remediation strategy selected;
- Details of the remediation methodologies employed;
- All background information, referencing key supporting documents including this report;
- A clear description of the remediation work undertaken with details of the sequence of events and verification sampling undertaken;
- Details of the methodology for verification, data collection and interpretation;
- Details of the final volumes and nature of materials excavated, pumped, treated, disposed of and imported. Supporting documentation (lorry tickets) will be included as an appendix where appropriate;
- A plan which shows the extent of the excavations and location of validation sampling points;
- The results of testing undertaken on all verification samples;
- The results of testing on all groundwater samples taken during the remediation works;
- Any works that have not been undertaken / remain outstanding;
- Conclusions regarding the success of the remedial works based on all available information.

A subsequent report detailing the results of post-remediation groundwater monitoring will also be produced on completion, which will include interpretation of the results, conclusions and recommendations for any further action as necessary.

8.0 CONCLUSIONS

Previous ground investigations have identified organic contamination (most notably from 1,2-dichlorobenzene) within Made Ground and natural Glacial Deposits, while organic contaminants (most notably 1,2-dichlorobenzene and chlorobenzene), bromide and cyanide have been identified in groundwater. Following the DQRA (described in a separate report) and the remediation options appraisal, the preferred remedial solution comprises the excavation and bioremediation of organic soil contamination hotspots, and the pumping of any contaminated shallow groundwater from excavations for treatment or disposal.

This will be supplemented by a monitoring programme to assess natural attenuation of groundwater after removal of significant sources of contamination within the soil.

Remediation verification samples, and samples of any treated, site won or imported material will be analysed and screened against the site remedial targets or generic assessment criteria, as appropriate.

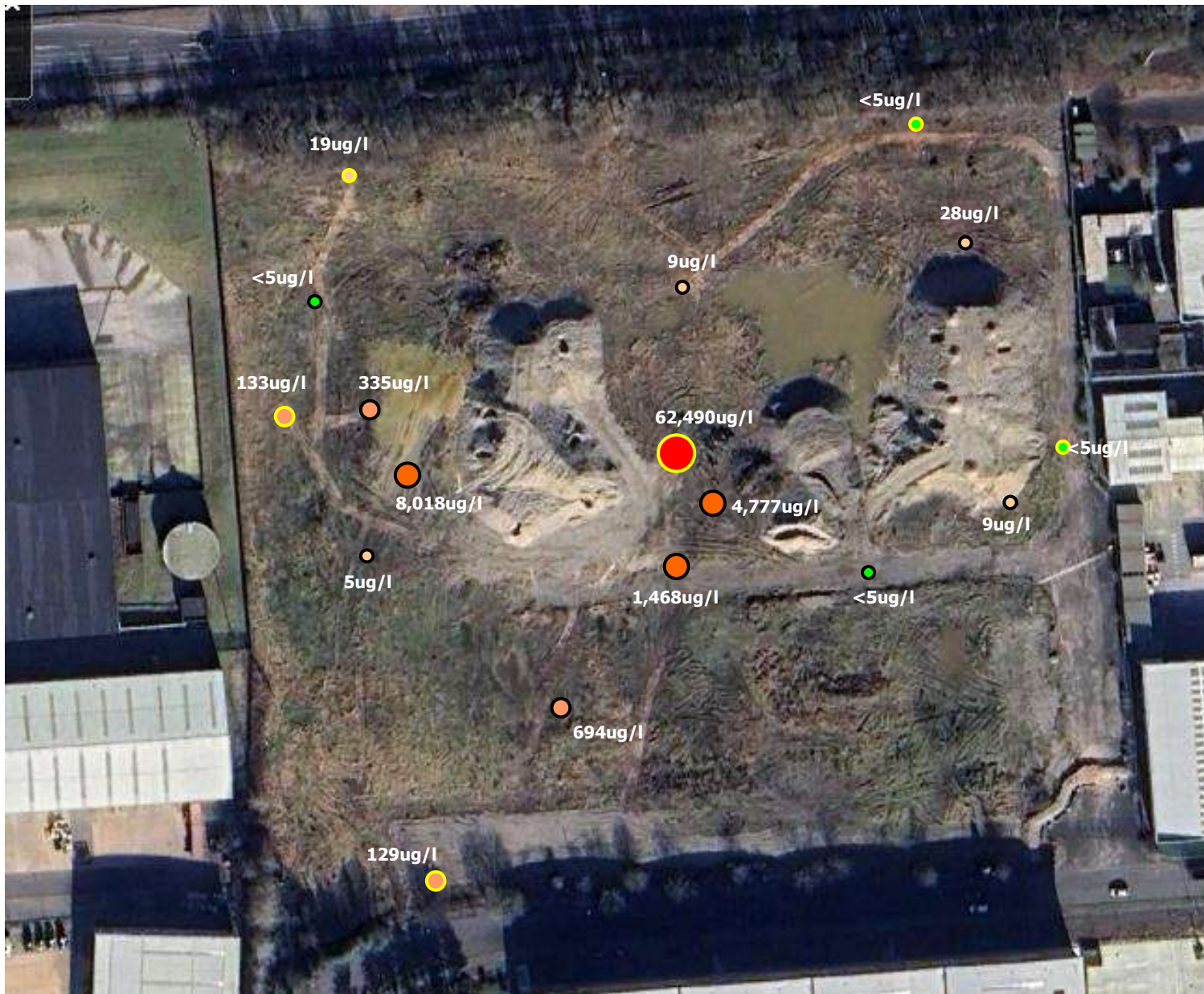
The remediation work will be supported by the production of a verification report.

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APPENDICES

A – Groundwater Contamination Distribution Plans



NOTES: DO NOT SCALE

- Deep groundwater
- Shallow groundwater



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CLIENT:
Knowsley Redvelopments Ltd

PROJECT:
**Former Contract Chemicals,
Penrhyn Road**

TITLE:
**1,2-dichlorobenzene
distribution in groundwater –
March 2025**

SCALE@SIZE : NTS	ISSUE: FINAL
DESIGN/DRAWN by : CMH	DATE: April 2025
PROJECT No: GJ224	DRAWING No: Photos01

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DO NOT SCALE
NOTES:

- Deep groundwater
- Shallow groundwater



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TITLE:
**Chlorobenzene distribution in
groundwater – March 2025**

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN by :	DATE:
CMH	April 2025
PROJECT No:	DRAWING No:
GJ224	Photos01

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DO NOT SCALE
NOTES:

- Deep groundwater
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PROJECT:
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TITLE:
**Bromide distribution in
groundwater – March 2025**

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN by :	DATE:
CMH	April 2025
PROJECT No:	DRAWING No:
GJ224	Photos01

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B – Remediation Options Appraisal

Remedial Method	Remedial Objectives			Score	Pros	Cons
	a	b	c			
Segregation	4	4	4	16	1) Avoids disposal of unaffected soils 2) Form of pre-treatment for waste disposal 3) Reduces disposal / treatment costs	1) Only suitable for identifiable hotspots and obvious deleterious materials
Off-site disposal	4	1	1	6	1) High degree of certainty of meeting criteria 2) Can address a wide range of contaminants, including those which may not be economical viable to remediate by other methods 3) Remediation timescales are fast in comparison to other techniques	1) Less sustainable option 2) Generates traffic around the local community and beyond 3) Import required to fill the void unless the site can be regarded to a lower level 4) High costs of disposal
Off-site Treatment at a Soil Treatment Facility	4	2	1	7	1) Removal of a full range of contaminants 2) Suitable for large amounts of treatment when the site cannot accommodate volumes in the available space 3) Cheaper than landfill	1) Higher cost than treating materials on site 2) Requires import of clean fill material 3) Generates traffic around the local community and beyond
Ex-situ Bioremediation	3	3	4	10	1) Easy to monitor and control procedure 2) Effective with organic contaminants 3) Relatively low cost technique using readily available plant 4) Very Sustainable treatment process 5) Chemical and geotechnical homogeneity of soil is improved	1) Relatively time consuming / labour intensive 2) Soils with a high clay or silt content can be difficult to treat. 3) Requires large treatment area 4) May not be suitable for all organic contaminants
Soil Vapour Extraction	2	3	2	7	1) Effective for volatile contaminants 2) Sustainable	1) Not effective on less volatile contaminants 2) Expensive over large areas 3) Relatively slow process 4) Off-gas treatment may require permit
In-Situ Chemical Oxidation / Reduction	2	1	2	5	1) Effective for organic contaminants 2) Sustainable	1) Expensive over large areas 2) Relatively slow process 3) Groundwater treatment may not offer significant benefits given results of DQRA
In Ground Barriers	2	1	2	5	1) Relatively Simple 2) Can work for a range of contaminants	1) High initial costs 2) May require ongoing maintenance 3) Requires appropriate geological conditions 4) Large volume of soils require re-use / disposal 5) Benefits may be limited given results of DQRA
Pump and Treat / Dispose	2	2	2	6	1) Easy to monitor and control from excavations 2) Effective for all groundwater contaminants 3) Relatively low cost 4) Can be used in conjunction with ex-situ bioremediation	1) Progress will depend on geology and rate of recharge 2) Requires disposal or treatment of extracted groundwater / product 3) Extracting from depth requires detailed plume / source characterisation and numerous extraction wells 4) Difficult to extract significant quantities of free phase contamination from depth
Natural Attenuation	2	4	3	9	1) No ground disturbance 2) Low cost technique 3) Sustainable	1) Slow process 2) Requires suitable ground conditions 3) Requires primary sources to be removed

Remedial objectives:

Providing certainty that the remediation solution meets the remedial criteria (a)

Providing a pragmatic and sustainable remedial option (b)

Providing an economical and viable remedial solution (c)

Scoring:

Highly suitable, easily meets the remedial objectives with a high degree of certainty – 4 points

Generally suitable but not necessarily the best option or some uncertainty may be present – 3 points

Moderately or possibly suitable, some significant uncertainty may be present – 2 points

Unsuitable or high degree of uncertainty regarding suitability – 1 point

Very unsuitable or contrary to objective – 0 points

APPENDIX 6

- Cut and Fill Drawings
- 25069-MJM-00-00-DR-C-9200 P03 – Cut & Fill Schematic
- Earthworks Movements Schematic
- Existing Stockpile & Spoil to be stabilised and re-used schematic
- Portway Phase 1 Validation Grid Drawing



PRELIMINARY VOLUMES	DESIGNER RISK INFORMATION
PROPOSED SITE AREAS EFFECTIVE SITE AREA APPROX = 35,700m² SITE SCRAPE SITE SCRAP ALLOWANCES AS FOLLOWS: 75mm SCRAPE UNLESS NOTED OTHERWISE SITE SCRAPE VOLUME = 2,653m³ ALLOWANCE TO BE MADE FOR RE-USE OF MATERIAL IN PROPOSED LANDSCAPING AREAS ASSUMED CONSTRUCTION BUILD-UPS FOR EARTHWORKS ONLY WAREHOUSE SLAB: 640mm EXTERNAL SERVICE YARD: 440mm CAR PARK: 350mm OFFICE SLAB: 600mm EXTERNAL CONCRETE BASE: 550mm FOOTPATH: 245mm FORMATION LEVEL IS TAKEN AS UNDERSIDE OF THE BUILD UPS ABOVE. ARISINGS NO ALLOWANCE HAS BEEN MADE FOR ARISING IN THIS ANALYSIS. SITE SCAPE TO FORMATION LEVEL TOTAL CUT = 12,372m³ TOTAL FILL = 13,852m³ TOTAL ARISING = 1500m³ NET VOLUME = 20m³ (CUT) SITE WON MATERIAL FROM CUT TO BE LAID AND COMPACTED TO ACHIEVE 95% MDD AND 5% CBR NO ALLOWANCE HAS BEEN MADE FOR BULKING. TYPE 1 TO SUB-BASE WAREHOUSE SLAB: 100mm = 1,751m³ EXTERNAL SERVICE YARD: 250mm = 2,638m³ CAR PARK: 250mm = 810m³ OFFICE SLAB: 100mm = 26m³ EXTERNAL CONCRETE BASE: 250mm = 35m³ FOOTPATH: 150mm = 1,22m³ TOTAL = 5,382m³ 6F5/2 TO CAPPING WAREHOUSE SLAB: 350mm = 6,128m³ OFFICE SLAB: 350mm = 92m³ TOTAL = 6,220m³ THERE IS 10,611m³ STOCKPILED 6F2 MATERIAL ON SITE THAT IS NOT INCLUDED WITHIN THE ABOVE FIGURES WHICH IS ASSUMED TO BE SUITABLE TO BE CRUSHED AND TREATED FOR USE AS CAPPING AND SUB BASE MATERIAL: SITE WON SUB-BASE = 5,382m³ SITE WON CAPPING = 5,229m³ TOTAL = 10,611m³ IMPORT 6F5 NET VOLUME = 991m³ (IMPORT) THE ABOVE FIGURES ARE FOR PRELIMINARY COSTING INFORMATION ONLY AND ARE SUBJECT TO FINAL SITE LAYOUT AND SITE INVESTIGATION. THIS DRAWING IS BASED ON THE FOLLOWING: BOL PROPOSED LEVELS LANDXML FILE "21065-BGL-XX-XX-M3-S-10200 P01 PROPOSED LEVELS" RECIEVED 05.03.25 TOPOGRAPHICAL DRAWING: SURVEY HUB, 5166 KNOWSLEY TOPOGRAPHICAL DATED DECEMBER 2021	IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:- CONSTRUCTION: MAINTENANCE/CLEANING: DECOMMISSIONING/DEMOLITION: IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. GENERAL NOTES ALL QUANTITIES ON THIS DRAWING ARE PROVISIONAL AND SHOULD BE VERIFIED BY THE CONTRACTOR PRIOR TO STARTING ON SITE. PARTICULARLY WITH REGARDS TO PHASING, WORKING SPACE REQUIREMENTS, SITE SCRAPE, CLIMATE CONDITIONS, BULKING, TESTING AND VERIFYING MATERIALS FOR RE-USE AS ENGINEERED FILL. GENERAL EARTHWORKS ALL EARTHWORKS TO BE CARRIED OUT IN ACCORDANCE WITH MJM CONSULTING ENGINEERS NBS-SECTION D THE CONTRACTORS ATTENTION IS DRAWN TO THE RELEVANT DESK STUDY/SITE INVESTIGATION REPORTS PREPARED FOR THE SITE, IN PARTICULAR ANY CONTAMINANTS THAT MAY AFFECT SITE OPERATIVES ANY CUT AND FILL QUANTITIES SHOWN ON THE DRAWINGS ARE PROVISIONAL & SHOULD BE VERIFIED BY THE CONTRACTOR, WITH ANY VARIATIONS BEING AGREED PRIOR TO COMMENCEMENT ON SITE. THE CONTRACTOR IS TO ALLOW FOR TOPSOIL STRIP, BULKING, CLIMATIC CONDITIONS & TESTING/CLARIFYING OF MATERIALS FOR RE-USE AS FILL. THE CONTRACTOR SHOULD MAKE ALLOWANCE FOR ANY TEMPORARY EARTH SUPPORT SYSTEMS REQUIRED DUE TO DIFFERENCE IN LEVELS THAT CAN NOT BE ACHIEVED BY SAFELY BATTERING THE GROUND ANY EXISTING LAND DRAINS TO BE PERMANENTLY DIVERTED TO FACILITATE CONSTRUCTION. SOFT SPOTS AT FORMATION LEVEL TO BE REMOVED, RECORDED AND BACKFILLED IN ACCORDANCE WITH CLAUSE D20-620/630

SURFACE LEVEL DATA			
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
1	-4.00	-3.50	
2	-3.50	-3.00	
3	-3.00	-2.50	
4	-2.50	-2.00	
5	-2.00	-1.50	
6	-1.50	-1.00	
7	-1.00	-0.50	
8	-0.50	0.00	
9	0.00	0.50	
10	0.50	1.00	
11	1.00	1.50	
12	1.50	2.00	
13	2.00	2.50	

mjm Consulting Engineers Ltd

Southgate House, 38 Southgate, Wakefield WF1 1TL
T: 01924 811 000 mjmc.co.uk

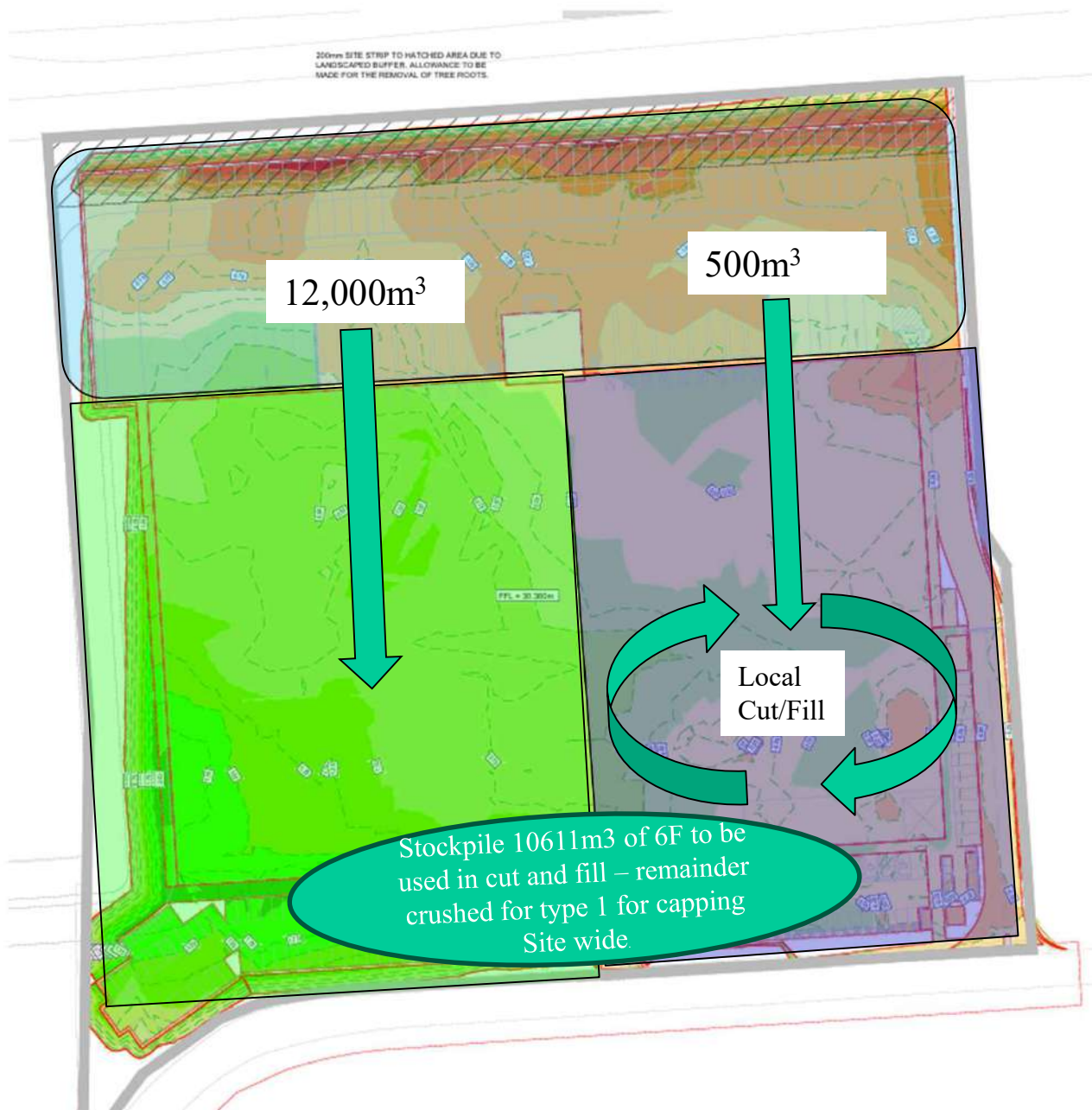
Project:
PENRYHN ROAD KNOWSLEY

Client:
GMI

Drawing Title:
EARTHWORKS
CUT & FILL

EH	CB	CB
MJM Ref: 25069	Scale: 1:500	Sheet Size: A1
Revision Status: P03	Suitability Status: S2	Date: MAR 25

INFORMATION		
Drawing Reference: Project - Originator - Zone - Level - File Type - Discipline - Number		
25069-MJM-00-00-DR-C-9200		



GMI
Penrhyn Road
Knowsley

Approx. Net Movements

Excludes Site Scrape
~2653 m³



W Maher and Sons Ltd
Rixton Old Hall
Rixton
WA3 6EW

Tel. 0161 776 2200
www.wmaherandsons.com

Client : GMI Construction Ltd

Project: Penrhyn Road

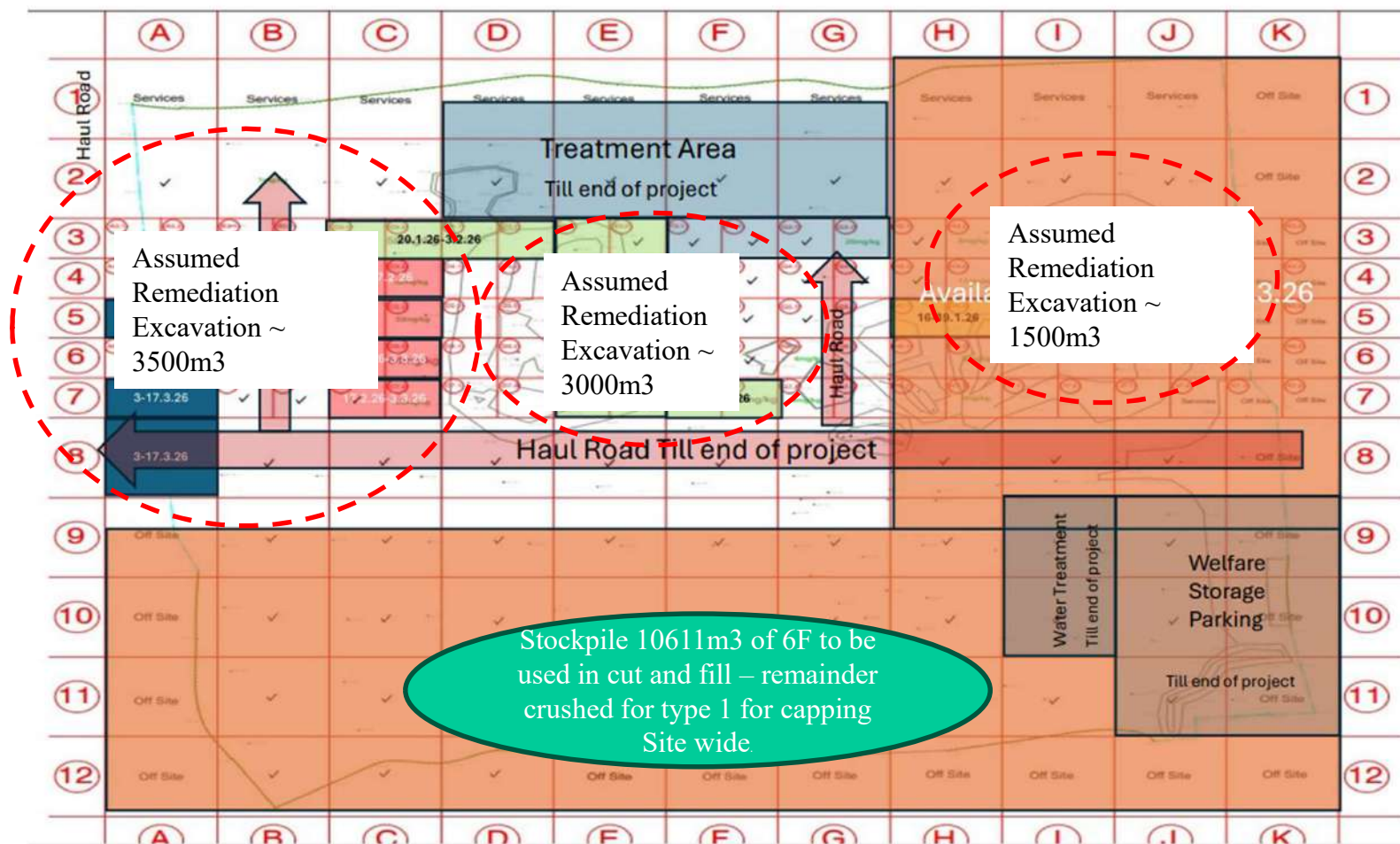
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Title: Earthworks Movement

Scale: NTS

Date Drawn: November 2025

Drawing No.: 18881 – Penrhyn Road – Net Movements



GMI
Penrhyn Road
Knowsley

Approx. Treatment
Volume 8,000m³



W Maher and Sons Ltd
Rixton Old Hall
Rixton
WA3 6EW

Tel. 0161 776 2200
www.wmaherandsons.com

Client :GMI Construction Ltd

Project: Penrhyn Road

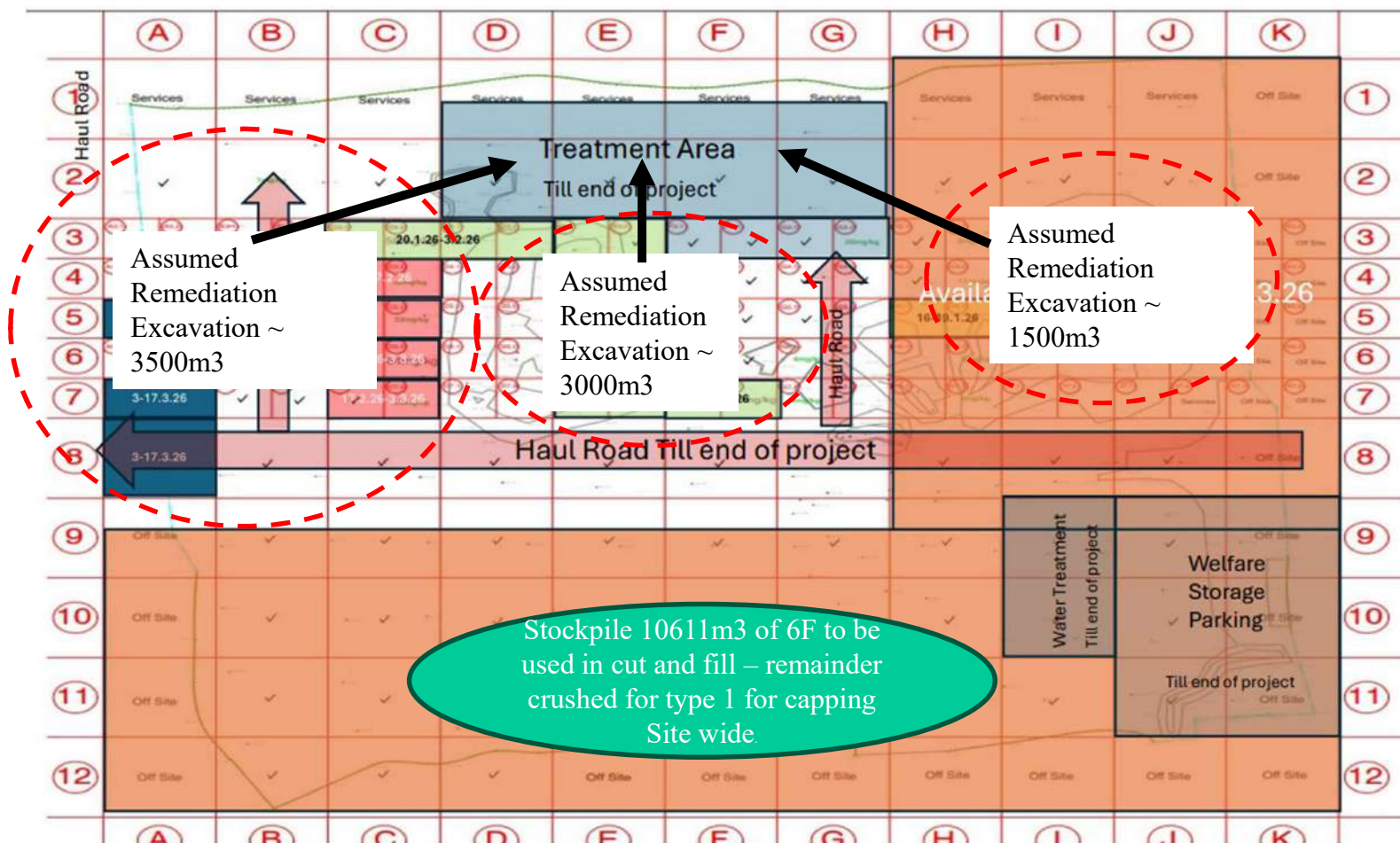
Job No.: 18881

Title: Earthworks Movement

Scale: NTS

Date Drawn: November 2025

Drawing No.: 18881 – Penrhyn Road



GMI
Penrhyn Road
Knowsley

Approx. Treatment
Volume 8,000m³



W Maher and Sons Ltd
Rixton Old Hall
Rixton
WA3 6EW

Tel. 0161 776 2200
www.wmaherandsons.com

Client :GMI Construction Ltd

Project: Penrhyn Road

Job No.: 18881

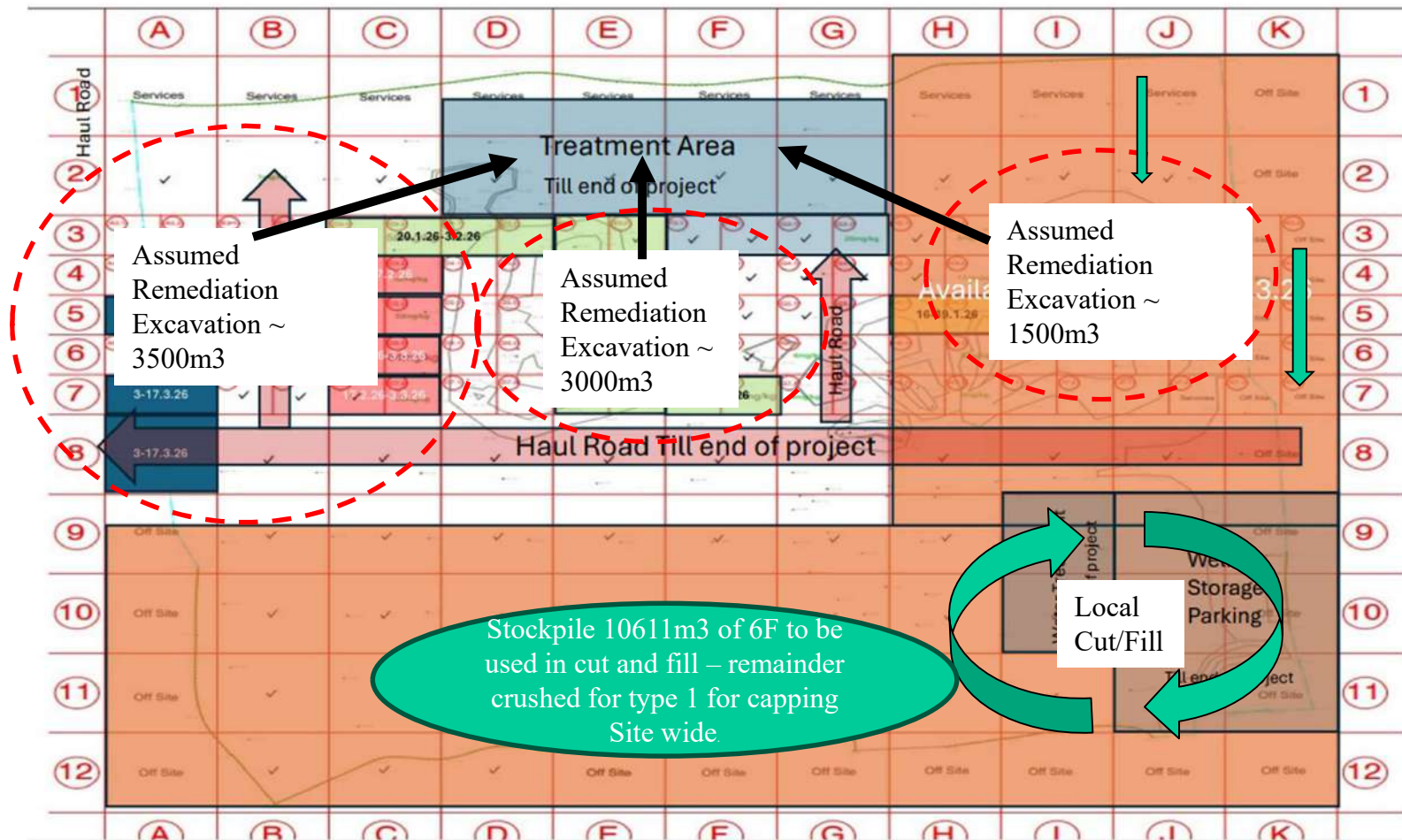
Title: Earthworks Movement

Scale: NTS

Date Drawn: November 2025

Drawing No.: 18881 – Penrhyn Road

March 2026



GMI
Penrhyn Road
Knowsley

Approx. Treatment
Volume 8,000m3



W Maher and Sons Ltd
Rixton Old Hall
Rixton
WA3 6EW

Tel. 0161 776 2200
www.wmaherandsons.com

Client :GMI Construction Ltd

Project: Penrhyn Road

Job No.: 18881

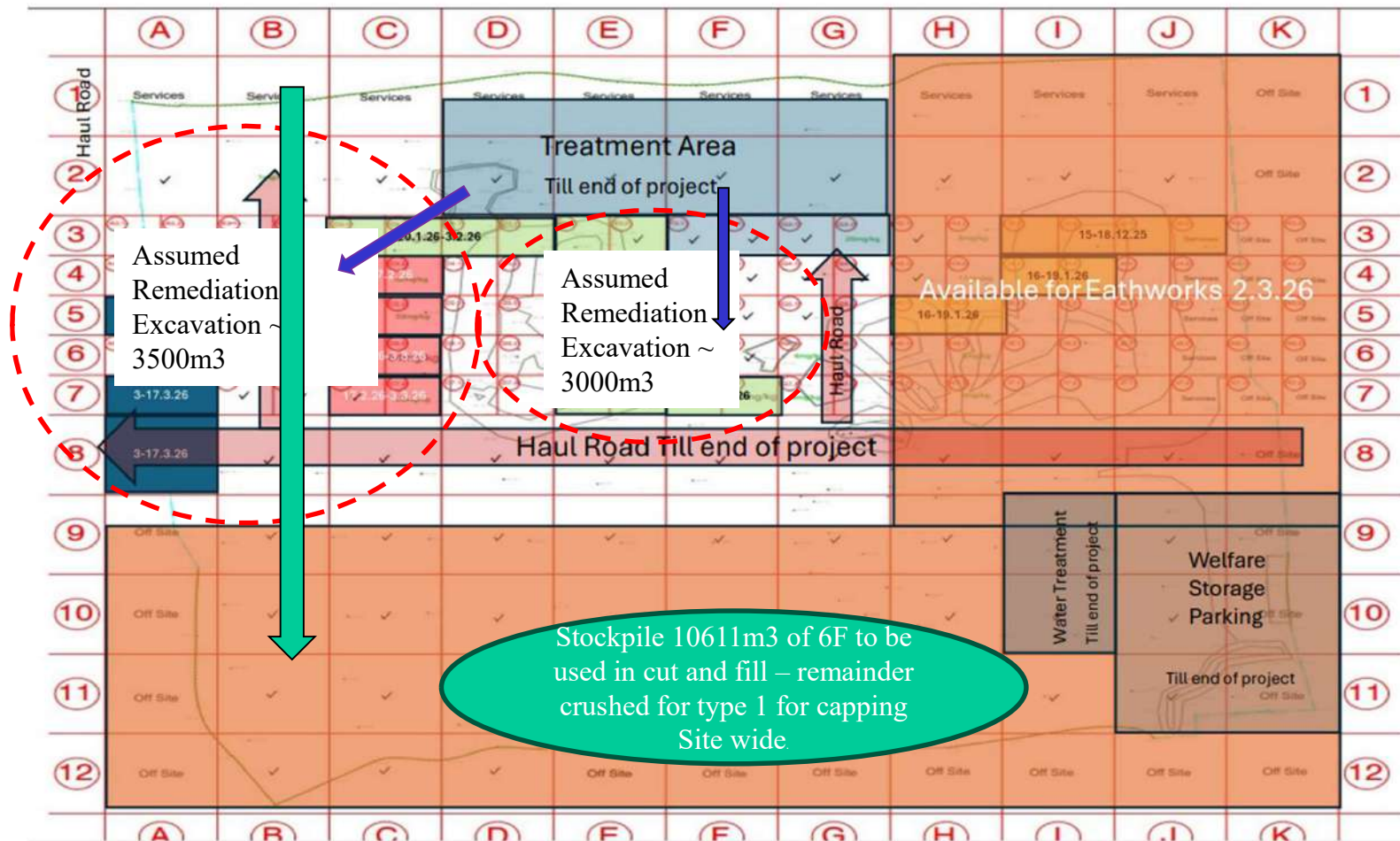
Title: Earthworks Movement

Scale: NTS

Date Drawn: November 2025

Drawing No.: 18881 – Penrhyn Road

April 2026



GMI
Penrhyn Road
Knowsley

Approx. Treatment
Volume 8,000m³



W Maher and Sons Ltd
Rixton Old Hall
Rixton
WA3 6EW

Tel. 0161 776 2200
www.wmaherandsons.com

Client :GMI Construction Ltd

Project: Penrhyn Road

Job No.: 18881

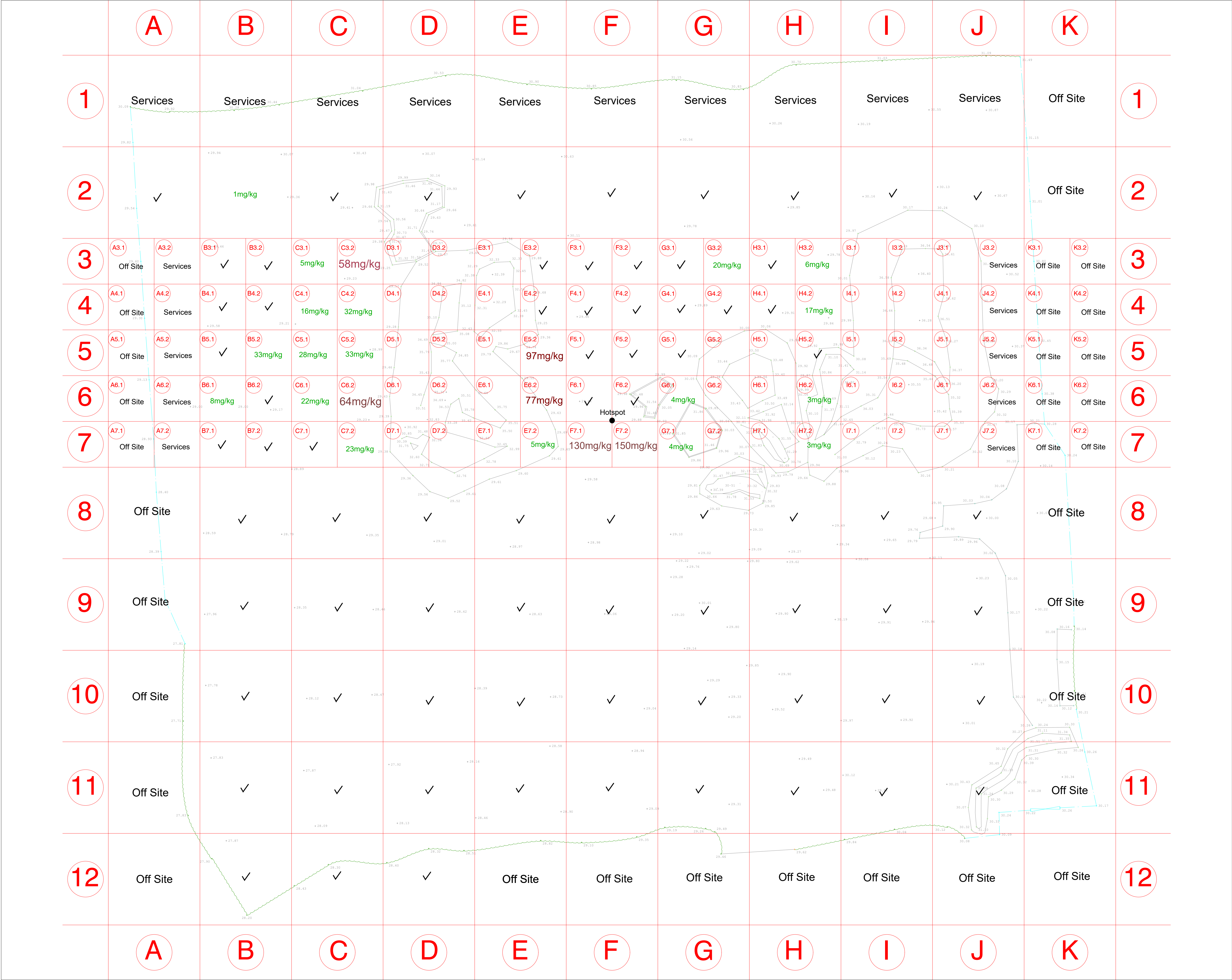
Title: Earthworks Movement

Scale: NTS

Date Drawn: November 2025

Drawing No.: 18881 – Penrhyn Road





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Only figured dimensions to be taken from this drawing, do not scale.

The Author of this drawing does not accept any liability for details or information provided by outside organisations.

Boundaries are shown for indicative purposes only, all boundaries are to be confirmed by the legal owner.

Test Results for:

1,2-Dichlorobenzene

All grid squares sampled, a tick refers to a sample of less then 1mg/kg or nil

Client

Contract number

Address PENRHYN ROAD, KNOWSLEY L34 9HY

Drawing *Testing Grid*

Scale	Sheet Size	
n/a	A1	
Date	Drawn	Checked
14/08/2025		
Job No	Drawing No	Rev
PTW25025		

- APPENDIX 7**
- Local Authority Correspondence
 - Discharge of Condition 8 parts 1 to 3



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22/00099/COND1
APPLICATION TO PART DISCHARGE CONDITION 8 PARTS 1-3 (REMEDIATION STRATEGY)
PERTAINING TO PLANNING PERMISSION 22/00099/FUL.

Contract Chemicals Ltd Penrhyn Road Knowsley Business Park Knowsley L34 9HY

Status	Unknown
Decision	Discharged
Decision Issued Date	Thu 23 Oct 2025
Appeal Status	Not Available
Appeal Decision	Not Available

There is 1 case associated with this application.

There is 1 property associated with this application.

A B C D E F G H I J K L M N O

P Q R S T U V W X Y Z

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- APPENDIX 8**
- Environmental Agency Correspondence
 - RE Penrhyn Road MMP Notification

Andrew Harris

From: GMMCWasteEnquiries GMMCWasteEnquiries
<GMMCWasteEnquiries@environment-agency.gov.uk>
Sent: 17 November 2025 16:04
To: Andrew Harris
Subject: RE: Penrhyn Road MMP Notification - Merebrook Consulting

You don't often get email from gmmcwesteenquiries@environment-agency.gov.uk. [Learn why this is important](#)

Good afternoon Andrew

Thank you for informing us you intend to use the DoWCoP for materials re-use on this site, providing that the DoWCoP is followed in full we have no objections to materials use, in accordance with our Regulatory Position Statement.

Materials not used in accordance with the DoWCoP process in full may be deemed waste and will require a relevant permit for deposit. A formal Declaration must be submitted by a Qualified Person **before** any use of materials on site or transfer is permitted.

The Qualified Person should be aware that based on our records the Greater Manchester, Merseyside and Cheshire Groundwater and Contaminated Land team in the Environment Agency has not reviewed any land quality documents associated with this development in respect of controlled waters. It is therefore important that the Qualified Person is satisfied that all relevant planning conditions associated with land contamination and risks to the environment have been met and the relevant conditions discharged.

Kind regards

Stephen Bostock

The Waste Enquiries Helpdesk Team

Environment Agency | Richard Fairclough House, Knutsford Road, Warrington, WA4 1HT

GMMCWasteEnquiries@environment-agency.gov.uk

Environment incident hotline (24/7) | 0800 80 70 60

General Enquiries | 03708 506 506

From: Andrew Harris <andrew.harris@merebrook.co.uk>
Sent: 10 November 2025 13:44
To: GMMCWasteEnquiries GMMCWasteEnquiries <GMMCWasteEnquiries@environment-agency.gov.uk>
Subject: Penrhyn Road MMP Notification - Merebrook Consulting

You don't often get email from andrew.harris@merebrook.co.uk. [Learn why this is important](#)

Good afternoon,

I am writing with regards to a development at Penrhyn Road located at Knowsley Business Park, Merseyside, L34 9GT.

A Materials Management Plan is being prepared for a development of land off Penrhyn Road and we are required to notify the Environment Agency of our intension to utilise aforementioned MMP under the DoW CoP.

The project involves the erection of a new industrial/logistics building (Uses B2, B8 and E(G)(III)) with ancillary offices, security gatehouse, transport office and associated works. Planning permission is associated with the

following planning approval at Knowsley Council (22/00099/FUL). Planning was approved subject to conditions in February 2022.

The site was largely undeveloped agricultural land until around 1980 when a chemical plant was constructed. This comprised contract chemical buildings and plant including processing plants and tank farms, warehousing and stage and office space, which have since been demolished and the site has been cleared, with some mounds of earth remaining on site including crushed demolition rubble. A series of Phase 2 ground investigations and a DQRA were carried out to assess the contaminate state of the site.

Under the CL:AIRE Definition of Waste: Development Industry Code of Practice Declaration (DoW CoP) I am required to make you aware that work from previous Contaminated Land Risk Assessments have identified several contamination sources.

Contamination within soil was predominantly in the form of organic compounds, most notably 1,2-dichlorobenzene, and to a lesser extent other BTEX compounds. Contamination within groundwater was encountered in the form of organic contamination, again most notable in the form of 1,2 dichlorobenzene.

A contaminated land risk assessment and remediation strategy and verification plan (RSVP) have been produced for the site and can be provided upon request. The RSVP has been accepted by Knowsley Council. The remediation strategy describes how the contaminated soils will be identified and remediated, and the measures required to manage any residual contamination. In order to demonstrate the effectiveness of remedial measures with respect to human health and controlled waters, soil and groundwater remedial targets/benchmark concentrations have been produced which are considered protective of the identified receptors (primarily future site users, the underlying groundwater and Knowsley Brook surface water). These will be used to evaluate the effectiveness of the remediation strategy.

We intend to re-use materials under an MMP in a manner that does not pose a risk to human health or the environment. A remedial strategy will be incorporated into the MMP and signed off by a QP in due course.

I hope that you find the proposed solution satisfactory, and I look forward to your response. Should you require any further information please do not hesitate to get in touch.

Kind Regards

Andy Harris

Please note my new email address and update your records accordingly.



Andrew Harris BSc (Hons), AMIEnvSci
Geo-Environmental Consultant
Rutherford House, Warrington Road, Birchwood
Cheshire, WA3 6ZH

T: 01773 829 988
M: 07720 405 364
E: andrew.harris@merebrook.co.uk
W: www.merebrook.co.uk

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APPENDIX 9

- Planning Permission
- Planning – Officer Comments



Knowsley Council

**REGENERATION AND ECONOMIC DEVELOPMENT
DEPARTMENT**

TOWN AND COUNTRY PLANNING ACT 1990

This application is subject to a Section 106 Agreement and needs to be read in conjunction with that Agreement.

PLANNING PERMISSION

Application No: 22/00099/FUL

Name and address of applicant

Knowsley Redevelopments Limited
C/o Gerald Eve LLP
No.1 Marsden Street
Manchester
M2 1HW

Name and address of agent

Gerald Eve LLP
No.1 Marsden Street
Manchester
M2 1HW

Date of Receipt: 15 February 2022

Date Valid: 18 February 2022

Address/Location Of Development:

Former Contract Chemicals Site
Penrhyn Road
Knowsley Business Park
Knowsley
L34 9HY

Description of Development:

ERECTION OF AN INDUSTRIAL/LOGISTICS BUILDING (USES B2, B8 AND E(G)(III)) WITH ANCILLARY OFFICES, SECURITY GATEHOUSE, TRANSPORT OFFICE AND ASSOCIATED WORKS

The Council of the Metropolitan Borough of Knowsley hereby give notice in pursuance of the above Act(s) that Planning Permission has been **granted** for the carrying out of the development referred to above in accordance with the application and plans submitted subject to the following condition(s):

1. The development must be begun not later than the expiration of three years beginning with the date of this permission.

Reason: In order to comply with the requirements of Section 91 of the Town and Country Planning Act 1990 (as amended).

2. The development hereby permitted shall be carried out in accordance with the approved plans and documents listed in Schedule 1.

Reason: For the avoidance of doubt.

3. Notwithstanding any description of materials in the application, no above ground construction works shall take place until samples and / or full specification of materials to be used externally on the buildings have been submitted to and approved in writing by the Local Planning Authority. Such details shall include the type, colour and texture of the materials. The development shall be carried out only in accordance with the agreed schedule of materials.

Reason: In the interests of visual amenity and to comply with Policy CS19 of the Knowsley Local Plan Core Strategy, adopted January 2016, and the National Planning Policy Framework.

4. The building hereby permitted shall not be brought into occupation under a majority Class B2 use or Class E(g)(iii) use until the areas indicated on the submitted plan Drwg No. 21002 P0102 REV H to be set aside for parking, servicing, vehicular manoeuvring (including provision for pedestrians/cyclists) have been surfaced, drained, and permanently marked out or demarcated in accordance with the details and specifications shown. For the avoidance of doubt this includes the 132 car parking spaces (inc. 8 disabled spaces) to the south, 15 car parking spaces to the east and 115 car parking spaces and 8 motorcycle spaces to the north. The parking provision shall be retained for such purposes at all times thereafter.

Should a majority Class B8 use occupy the site then the northern parking provision highlighted on submitted plan Drg No. 21002 P0102 REV H shall be reconfigured to provide 46 HGV parking spaces. The 132 car parking spaces (incl. 8 disabled spaces) to the south and the 15 car parking spaces to the east shall be implemented and retained thereafter, any such Layout proposal shall be submitted to and approved in writing by the Local Planning Authority prior to the first occupation of the building. The parking provision shall be retained for such purposes at all times thereafter.

Reason: To ensure sufficient on site car parking is provided dependant on the majority use of the building in the interests of highway safety and to ensure compliance with policies CS7 & CS19 of the Knowsley Local Plan Core Strategy, adopted January 2016, and the National Planning Policy Framework.

5. No part of the development shall be brought into use until visibility splays of 2.4 metres by 55m metres, have been provided at both proposed (site access) junctions with Penrhyn Road. The splays shall be provided clear of obstructions to visibility above the height of 0.6 metres measured from the footway/verge level. Once created, the visibility splays shall be maintained clear of any obstruction and shall be retained at all times.

Reason: To ensure satisfactory visibility is provided at the site access points in the interests of highway safety and to ensure compliance with policies CS7 & CS19 of the Knowsley Local Plan Core Strategy, adopted January 2016, and the National Planning Policy Framework.

6. The substation hereby permitted shall not be commenced until full details of the structure including finishes and materials have been submitted to and approved in writing by the Local Planning Authority. The substation shall be constructed in accordance with the approved details.

Reason: In the interests of visual amenity and to comply with Policy CS19 of the Knowsley Local Plan Core Strategy, adopted January 2016.

7. No part of the development hereby permitted shall be commenced until a Construction Environmental Management Plan that details the means of mitigation of construction effects has been submitted and agreed in writing by the Local Planning Authority. This shall include the following:
- a. Methods for the mitigation of noise and vibration from building works, including any piling works, and also from the operation of any temporary power generation or pumping plant which will operate overnight.
 - b. Methods for dust control and suppression.
 - c. Control of transfer of mud out of the site - details of wheel washing facilities including location and type.
 - d. The areas for the storage of plant and materials.
 - e. A programme of works, including phasing
 - f. Location of site compound, including any loading/unloading areas, turning areas for delivery vehicles and construction staff parking arrangements.
 - g. Scheme for recycling/disposal of waste resulting from demolition and construction works.
 - h. Proposed hours of construction (the following is usually acceptable: 0800 to 1800 Monday to Friday, 0800 to 1300 Saturday and not at all on Sundays/Public Holidays).
 - i. A method statement relating to the eradication of Cotoneaster on the site.

All site works shall then proceed only in accordance with the approved management plan.

Reason: To ensure the satisfactory development of the site and in the interests of protecting the amenity of neighbouring occupiers and to comply with the National Planning Policy Framework; Policies CS2 and CS19 of the Knowsley Local Plan Core Strategy adopted January 2016; Policy WM9 of the Merseyside and Halton Joint Waste Local Plan 2013 and saved Policies H5 and ENV2 of the Knowsley Replacement Unitary Development Plan adopted June 2006.

8. No development approved by this planning permission shall commence until a remediation strategy to deal with the risks associated with contamination of the site in respect of the development hereby permitted, has been submitted to, and approved in writing by, the local planning authority. This strategy will include the following components:
1. A preliminary risk assessment which has identified:
 - all previous uses
 - potential contaminants associated with the site, including those from the previous uses.
 - a conceptual model of the site indicating sources, pathways and receptors.
 - potentially unacceptable risks arising from contamination at the site
 2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off-site.
 3. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

4. Prior to the first occupation of the development a verification report and plan shall be submitted to and approved in writing by the Local Planning Authority that provides details of the data that has been collected, in order to demonstrate that the works set out in the remediation strategy in (3) are complete and any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action have been identified. Any changes to these components require the written consent of the local planning authority. The scheme shall be implemented as approved.
5. In the event that contamination is found at any time when carrying out the approved development, that was not previously identified, it must be reported immediately to the Local Planning Authority. Development on the part of the site affected must be halted and a risk assessment carried out and submitted to and approved in writing by the Local Planning Authority. Where unacceptable risks are found remediation and verification schemes shall be submitted to and approved in writing by the Local Planning Authority. These shall be implemented prior to the development (or relevant phase of development) being brought into use.
6. If site won materials (waste and non-waste) are to be reused on site, then prior to this work being carried out, a Materials Management Plan, signed off by a Qualified Person, shall be submitted to and agreed in writing with the local planning authority. The MMP shall demonstrate that any reuse of contaminated materials does not result in increased risk to the environment or human health.
7. No soil is to be imported to the site until it has been tested for contamination and assessed for its suitability for the proposed development; a suitable methodology for testing this material should be submitted to and agreed by the Local Planning Authority prior to the soils being imported onto site. The methodology should include the sampling frequency, testing schedules, criteria against which the analytical results will be assessed (as determined by the risk assessment) and source material information. The analysis shall then be carried out and evidence submitted to and approved in writing by the Local Planning Authority.

Reason: To ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution in line with the National Planning Policy Framework and to prevent deterioration of a water quality element to a lower status class in the underlying aquifer and the adjacent water course and to comply with Policy ENV5 of the Knowsley Replacement Unitary Development Plan, adopted June 2006

9. Development shall not commence until a detailed SUDS based drainage scheme based on the principles of The SUDS Manual (C753) and the criteria as set out within Knowsley Strategic Flood Risk Assessment (SFRA, Levels 2), has been submitted and approved in writing by the Local Planning Authority (LPA). The applicant should provide suitable drainage drawings, summary calculations and results of all investigations detailing the surface water drainage works as set out below. The maximum rate of discharge, off-site, shall not exceed the 120l/s and be in line with the drainage strategy as set out within the FRA dated Feb 2022 unless otherwise agreed in writing with the LPA. The works shall be implemented in accordance with the approved scheme before the development is brought into use.

Reason: To prevent increased risk of flooding by ensuring the satisfactory storage of and disposal of surface water from the site and to comply with policies CS2 and CS24 of the Knowsley Local Plan: Core Strategy (January 2016).

10. Prior to the first occupation of the development, a Management and Maintenance Plan for the sustainable drainage system relating to the lifetime of the development through an appropriate legally binding agreement shall be submitted to and approved in writing by the Local Planning Authority. This shall include:
- i. The arrangements for adoption by an appropriate public body or statutory undertaker or details of provision for management and maintenance by a resident's management company.
 - ii. Arrangements for inspection and ongoing maintenance of all elements of the sustainable drainage system to secure the operation of the surface water drainage scheme throughout its lifetime.
 - iii. Details for planned maintenance and a mechanism for remedial and urgent repair works.
 - iv. Means of access for inspection and maintenance purposes.

The plan shall be implemented in accordance with the timeframes contained within it.

Reason: To ensure effectiveness of the flood risk measures during the lifetime of the development and to comply policies CS2 and CS24 of the Knowsley Local Plan: Core Strategy (January 2016).

11. Any works to fell the willow tree in the woodland edge identified as having bat roost potential shall employ soft felling techniques under the supervision of a suitably qualified ecologist.

Reason: To ensure the protection of bats which are a protected species under the Wildlife and Countryside Act 1981 and to ensure compliance with policy CS8 of the Knowsley Local Plan: Core Strategy (January 2016).

12. The following reasonable avoidance measures should be put in place prior to the commencement of development and retained until the development renders them no longer necessary to ensure that there are no adverse effects on badger and hedgehogs: -

- A pre-commencement check for badger and hedgehog mammals.
- All trenches and excavations should have a means of escape (e.g. a ramp
- Any exposed open pipe systems should be capped to prevent mammals gaining access; and
- Appropriate storage of materials to ensure that mammals do not use them.

Reason: To ensure the protection of badgers which are a protected species and hedgehogs which are a priority species and to ensure compliance with policy CS8 of the Knowsley Local Plan: Core Strategy (January 2016).

13. All hard and soft landscape works shall be carried out in accordance with the approved details shown on Detailed Softworks Plan DRG 10585-FPCR-XX-XX-DR-L-0001 ISSUE P09. The works shall be carried out before any part of the development is occupied or in accordance with a timescale to be agreed in writing with the Local Planning Authority.

Reason: To ensure that the site is satisfactorily landscaped having regard to its location and the nature of the proposed development and to comply with, Policies CS2 and CS19 of the Knowsley Local Plan Core Strategy, adopted January 2016, Saved Policy H5 of the Knowsley Replacement Unitary Development Plan, adopted June 2006 and the National Planning Policy Framework.

14. Notwithstanding the details submitted a long term (30 years) landscape management plan, including long term design objectives, management responsibilities and maintenance schedules for all landscape areas (retained and proposed) shall be submitted to and approved in writing by the Local Planning Authority prior to first occupation of the development.

The landscape management plan shall be implemented as approved before the development is occupied, or in accordance with a timetable agreed in writing with the Local Planning Authority.

Reason: To ensure that the site is satisfactorily landscaped having regard to its location and the nature of the proposed development and to comply with, Policies CS2 and CS19 of the Knowsley Local Plan Core Strategy, adopted January 2016, and the National Planning Policy Framework.

SCHEDULE 1

Date Received	Ref. No	Version	Drawing/Document Title
16/02/2022	21002 P1002 REV A	-	MAIN OFFICE FLOORPLAN
04/10/2023	REV 04.10.23	-	BIODIVERSITY METRIC REV 04.10.23
04/10/2023	10585-E-05	-	REVISED CONDITION DISTINCTIVENESS
04/10/2023	FIGURE 2	-	REVISED HABITAT PLAN
14/08/2023	10585-FPCR-XX- XX-DR-L-0001- P09-	-	REVISED SIFTWORKS LANDSCAPING
09/03/2023	P109-3457-ESC- REV D	-	LIGHTING LAYOUT
09/03/2023	21002-F0025 REV B	-	SITE LAYOU UU OVERLAY
09/03/2023	5166	-	CCTV DRAINAGE CONDITION SURVEY
24/05/2022	21002 P0103 REV E	-	FENCE LAYOUT
24/05/2022	21002 P0104 REV E	-	CYCLE SHELTER & WASTE AREA DETAILS
24/05/2022	21002 P1001 REV B	-	WAREHOUSE PLAN
24/05/2022	21002 P0105 REV E	-	SITE LAYOUT - PEDESTRIAN AND CYCLE ROUTES
24/05/2022	21002 P0105 REV E	-	SITE LAYOUT - PEDESTRIAN AND CYCLE ROUTES
24/05/2022	21002 P0106 REV E	-	SITE LAYOUT - EXTERNAL FINISHES
24/05/2022	21002 P1003 REV B	-	TRANSPORT OFFICE PLAN
24/05/2022	21002 P1004 REV C	-	PROPOSED ELEVATIONS

24/05/2022	21002 P1005 REV C	-	ROOF PLAN
24/05/2022	21002 P1006 REV B	-	BUILDING SECTION
24/05/2022	21002 P1002 REV H	-	SITE LAYOUT
16/02/2022	PART 2	-	Transport Assessment Part 2
16/02/2022	PART 1	-	Transport Assessment Part 1
16/02/2022	LOCPLAN	-	LOCATION PLAN
16/02/2022	21002 P0107 REV B	-	GATE HOUSE DETAILS
16/02/2022	21065-BGL-XX- XX-DR-S-0200	P3	
16/02/2022	21065-BGL-XX- XX-SK-S-0001	P6	SWEPT PATH DETAILS

REASON(S) FOR THE GRANTING OF PLANNING PERMISSION

The decision to grant planning permission has also been taken having regard to the policies and proposals as set out below, and to all relevant material considerations including supplementary planning guidance:-

CS2 - Development Principles
CS4 - Economy and Employment
CS7 - Transport Networks
CS11 - Principal Regeneration Area - Knowsley Industrial and Business Parks
CS19 - Design Quality and Accessibility in New Development
CS24 - Managing Flood Risk

KNOWSLEY LOCAL PLAN: CORE STRATEGY

SAVED POLICIES - KNOWSLEY REPLACEMENT UNITARY DEVELOPMENT PLAN (ADOPTED JUNE 2006)

EC3 - Primarily Industrial Areas
T5 - Location of Major Traffic Generating New Development
T9 - Travel Plans
DQ4 - Trees and Development
CS8 - Green Infrastructure
ENV2 - Noise and Vibration
ENV5 - Contaminated Land
National Planning Policy Framework

This informative is only intended as a summary of the reason(s) for the granting of planning permission. Should you require any further details relating to the decision please contact the relevant case officer (Mark Quinn on 0151 443 2381)

ARTICLE 35 STATEMENT

The Local Planning Authority has acted positively and proactively in determining this application by identifying matters of concern within the application (as originally submitted) and negotiating with the applicant, acceptable amendments to the proposal to address those concerns. As a result, the Local Planning Authority has been able to grant planning permission for an acceptable proposal, in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.

NOTE FOR APPLICANT:

IMPORTANT - PLEASE READ CAREFULLY THE NOTES BELOW AS FAILURE TO COMPLY COULD MAKE THE DEVELOPMENT HEREBY PERMITTED UNAUTHORISED

- 1) This planning permission is granted in strict accordance with the approved plans. It should be noted however that:
 - a) Any variation from the approved plans following commencement of the development, irrespective of the degree of variation, will constitute unauthorised development and may be liable to enforcement action.
 - b) You or your agent or any other person responsible for implementing this permission should inform Planning Services immediately of any proposed variation from the approved plans and ask to be advised as to the best method to resolve the matter. Most proposals for variation to the approved plans will require the submission of a new planning application.
- 2) This permission is granted subject to conditions, and it is the owner of the property and the person responsible for the implementation of the development who will be fully responsible for their compliance throughout the development and beyond.
- 3) If there is a condition that requires work to be carried out or details to be approved prior to the commencement of the development this is called a "condition precedent". The following should be noted with regards to conditions precedent.
 - a) If a condition precedent is not complied with prior to the start of development, the whole of the development will be unauthorised and you may be liable to enforcement action.
 - b) In addition, if the requirements of a condition precedent are subsequently not complied with, the development is unauthorised and the only way to rectify the development is the submission of a new application.

If any other type of condition is breached then you will be liable to a breach of condition notice.

Informatives

- 1 The following should be included within the submission relating to condition 9.
 - i. Drainage proposals should be designed to cope with events up to the 1 in 100 plus 40% CC events. Where the design is capped using the 1 in 30 event, the proposed drainage design should be able to demonstrate that at what points surcharges and floodings occur, what would be the volume of flood water and where the flood water flows or pools within the site. In this state, the surface water extent, depth and velocity during the 1 in 100 plus 40% CC event should be demonstrated (preferably using a 2D surface water hydraulic model). Storage calculations should be provided, along with evidence that these calculations have been completed according to a suitable method. Where an attenuation storage facility is required, it should be designed for the 1 in 100 years 6 hours storm event including 40% climate change.
 - ii. Consideration of water quality has been taken as part of the proposed drainage design. It will be required to demonstrate that adequate water quality of the off-site surface water flows (draining into a sewer, watercourse and ground) in accordance with the Simplified Index Approach as set out within Section 26 of the SUDS Manual (C753) can be achieved. Given the nature of the development and number of car parks considered, oil separators will be required car parking area. As part of water quality treatment, water quality risk to surface water and groundwater should be assessed (screening or detailed risk assessment) and mitigation measure to be adopted to ensure that risk to both surface water and groundwater are effectively managed (see Table 26.1 of the SUDS Manual).
 - iii. Flow routes need to be considered when all on-site drainage systems have been

overwhelmed by an event of greater intensity than the design criteria (1 in 100 + 40% CC). The impact of exceedance flows from and on adjacent land should also be considered. In considering the exceedance event, as a minimum, the 1 in 200 event plus 40% CC should be considered in calculations. Calculations and plans should be provided to show where above-ground flooding might occur, where this would pool and flow and the maximum depth of flood flows shall be established and managed so as to mitigate the flood impact to people and buildings. Evidence that the exceedance event has been considered will be required.

- iv. An evaluation of impact of potential failure of the drainage system should be provided. The risk assessment should include for blockage of pipes, blockage of outlet structures and risk of impediments across planned flood routing paths. The drainage design should be supported by a designer's risk assessment that identifies key points of failure of the system and what means have been considered to limit risk of failure. This will also inform the maintenance plan with regards to corrective actions needed should a failure occurs.
 - v. An updated Model Information (Micro Drainage or similar approved) considering above points will be required. Results showing all the modelling criteria and summary network results including attenuation mechanism for critical 1 in 2 years, 1 in 30 years and 1 in 100 years plus 40% CC storm events along with maximum water level, flow and velocity and details of any surface flooding anticipated will be required.
 - vi. Detailed Drainage Scheme Plan showing the layout of the proposed drainage network for development, post development catchment areas to each SUD feature, SUDs features adopted for interception of first 5mm of rainfall, the location of the storage within the proposed development and how these relate to the submitted calculations, including any chamber, pipe numbers, direction of flow, invert and cover levels, gradients diameters and dimensions. Preferably, a standalone drainage strategy report is required to demonstrate how the submitted calculations are related to the proposed drainage/SUDs features.
 - vii. Summary Drainage Report setting out the Drainage Strategy and results of the calculations demonstrating compliance with the above.
 - viii. Where third party agreements to construct sewers and to discharge flows are required, then written evidence of these two agreements shall be provided. In this case, the UU has concerns relating to the proximity of the proposed car parking to their critical water main asset that crosses the north of the site.
2. Breeding birds are protected under the general provision of Section 1 of the Wildlife and Countryside Act 1981 as amended. Whilst the nest is being built or is in use, the eggs, young and nest are protected against intentional and reckless taking, damage and destruction. No tree, scrub or hedgerow felling, management and/or cutting operations should take place during the period 1 March to 31 August inclusive to protect breeding birds.
 3. In relation to Condition 7-part g) the following information should be provided.
 - the anticipated nature and volumes of waste that the development will generate.
 - where appropriate, the steps to be taken to ensure the maximum amount of waste arising from development on previously developed land is incorporated within the new development.
 - the steps to be taken to ensure effective segregation of wastes at source including, as appropriate, the provision of waste sorting, storage, recovery and recycling facilities; and
 - any other steps to be taken to manage the waste that cannot be incorporated within the new development or that arises once development is complete.
 4. See letters from United Utilities dated 2nd May 2023, Environment Agency dated 20th July 2022, Cadent Gas dated 17th May 2022 and Merseyside Fire dated 28th March 2022.
 5. The submission in relation to condition 14 shall address the following matters:- it is known that some of the plants, like Rosemary, do have a shortened life span, so an ongoing replacement

planting regime should be incorporated within the maintenance plan. Dead trees should be replaced for the first 5 years and tree staking / ties should be removed within 3-5 years, so not to harm the trees once they have established. The bark mulch level also needs to be maintained / topped up as required on an annual basis. Details should also be included on the management and maintenance of the grass / wildflower areas.

6. The applicant should contact United Utilities to agree how the existing water main should be protected whilst the development is implemented to ensure the water main is not damaged.

Executive Director - Regeneration and Economic Development

Date: 14 November 2023

IMPORTANT NOTES FOR YOUR ATTENTION:

1. This permission refers only to that required under the Town and Country Planning Acts and does not include any consent or approval under any other enactment, bylaw, order or regulation.
2. This permission refers only to those plans submitted as part of the Planning Application a copy of which is retained by the Local Planning Authority. The Local Planning Authority should be contacted in writing if it is proposed to amend these plans in any way as a further permission, may be required.
3. You should ensure that you understand the requirements of all planning conditions and that you fully comply with their requirements. If you are in any doubt about what a condition requires of you, please ask us for assistance. Planning conditions may require you to submit further information to us and await our approval before you can start your development. A failure to do so could result in your development being unlawful and necessitate the submission of a further planning application. A failure to comply with the conditions of the permission/consent may result in the taking of enforcement and potentially legal action, against you to remedy the breach of planning control.
4. A fee is normally payable to discharge planning conditions in accordance with government regulations.
5. This permission does not convey any rights or approval to build on, or develop, any land that is not fully owned or controlled by you, including on party boundaries. You should satisfy yourself that the agreement of any adjoining landowners has been given prior to commencing any building works.
6. If a Building Regulations Consent is required for these works it is your responsibility to ensure that the plans submitted for both the Building Regulations Consent and Planning Permission are the same in all respects. Should the plans relating to one consent vary from the other, it will be necessary for you to submit amended plans to this Department and obtain the relevant approval(s) prior to commencing any works. Knowsley Council's Building Control team are contactable on (0151)-443 2342 and they would be pleased to assist you.

Appeals to the Secretary of State

- If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990.
- If you want to appeal against your local planning authority's decision then you must do so within 6 months of the date of this notice.
- Appeals can be made online at: <https://www.gov.uk/planning-inspectorate>.
If you are unable to access the online appeal form, please contact the Planning Inspectorate to obtain a paper copy of the appeal form on tel: 0303 444 5000.
- The Secretary of State can allow a longer period for giving notice of an appeal but will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.
- The Secretary of State need not consider an appeal if it seems to the Secretary of State that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.

Knowsley Council
By email

Your ref: 22/00099/FUL
Our ref: DC/22/752v2
Date: 02-MAY-23

Dear Planning Team

Location : Former Contract Chemicals Site Penrhyn Road Knowsley Business Park Knowsley L34 9HY.

Proposal : ERECTION OF AN INDUSTRIAL/LOGISTICS BUILDING (USES B2, B8 AND E(g)(iii)) WITH ANCILLARY OFFICES, SECURITY GATEHOUSE, TRANSPORT OFFICE AND ASSOCIATED WORKS.

United Utilities wish to make the following comments regarding the proposal detailed above.

UNITED UTILITIES WATER MAIN – OBJECTION REMOVAL

United Utilities raised concerns in the first representation submitted to this application on 29th March 2022.

After discussions and agreement with the applicant, United Utilities are now happy to remove our objection as the principle location of the asset has been determined. There are however, construction details that need to be agreed prior to commencement. We are happy to remove the objection should the below condition be inserted to any subsequent Decision Notice.

CONDITION 1 – Protection of United Utilities Water Main

No construction shall commence (including any earthworks) until details of the means of ensuring the water main that is laid within the site boundary is protected from damage as a result of the development have been submitted to and approved by the Local Planning Authority in writing. The details shall include a survey that identifies the exact location of the water main, the potential impacts on the water main from construction activities the impacts post completion of the development on the water main infrastructure that crosses the site and identify mitigation measures, including a timetable for implementation, to protect and prevent any damage to the water main both during construction and post completion of the development.

Any mitigation measures shall be implemented in full prior to commencement of development in accordance with the approved details and timetable and shall be retained thereafter for the lifetime of the development.

In the event that the survey of the water main identifies the buildings/plots as within a 5m standoff either side of the main (10m in total), the developer shall submit evidence to the Local Planning Authority that a diversion has been agreed in writing with the relevant statutory undertaker and that the approved works have been undertaken prior to the commencement of development.

Reason: In the interest of public health and to ensure protection of the public water supply.

DRAINAGE

Following on from our original comments, relating to Drawing 21065-BGL-XX-XX-DR-S-0250, Rev P3 - Dated 25/01/2022, we can confirm the proposals are acceptable in principle.

We however request the following drainage condition is attached to any subsequent approval to secure the necessary detailed drainage schemes prior to commencement:

Condition 2 – Foul and Surface Water Drainage

Prior to the commencement of development, details of a sustainable surface water drainage scheme and a foul water drainage scheme shall be submitted to and approved in writing by the Local Planning Authority. The drainage schemes must include:

- (i) An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water in accordance with BRE365;*
- (ii) A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations);*
- (iii) Levels of the proposed drainage systems including proposed ground and finished floor levels in AOD;*
- (iv) Incorporate mitigation measures to manage the risk of sewer surcharge where applicable; and*
- (v) Foul and surface water shall drain on separate systems.*

The approved schemes shall also be in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards.

Prior to occupation of the proposed development, the drainage schemes shall be completed in accordance with the approved details and retained thereafter for the lifetime of the development.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution.

The applicant can discuss any of the above with Developer Engineer, **Graham Perry**, by email at wastewaterdeveloperservices@uuplc.co.uk.

Please note, United Utilities is not responsible for advising on rates of discharge to the local watercourse system. This is a matter for discussion with the Lead Local Flood Authority and / or the Environment Agency (if the watercourse is classified as main river).

If the applicant intends to offer wastewater assets forward for adoption by United Utilities, their proposed detailed design will be subject to a technical appraisal by our Developer Services team and must meet the requirements outlined in 'Sewers for Adoption and United Utilities' Asset Standards'. This is important as drainage design can be a key determining factor of site levels and layout.

Acceptance of a drainage strategy does not infer that a detailed drainage design will meet the requirements for a successful adoption application. We strongly recommend that no construction commences until the detailed drainage design, has been assessed and accepted in writing by United Utilities. Any work carried out prior to the technical assessment being approved is done entirely at the developer's own risk and could be subject to change.

Management and Maintenance of Sustainable Drainage Systems

Without effective management and maintenance, sustainable drainage systems can fail or become ineffective. As a provider of wastewater services, we believe we have a duty to advise the Local Planning Authority of this potential risk to ensure the longevity of the surface water drainage system and the service it provides to people. We also wish to minimise the risk of a sustainable drainage system having a detrimental impact on the public sewer network should the two systems interact. We therefore recommend the Local Planning Authority include a condition in their Decision Notice regarding a management and maintenance regime for any sustainable drainage system that is included as part of the proposed development. You may find the condition below a useful example.

Prior to occupation of the development a sustainable drainage management and maintenance plan for the lifetime of the development shall be submitted to the local planning authority and agreed in writing. The sustainable drainage management and maintenance plan shall include as a minimum:

- a. Arrangements for adoption by an appropriate public body or statutory undertaker, or, management and maintenance by a resident's management company; and*
- b. Arrangements for inspection and ongoing maintenance of all elements of the sustainable drainage system to secure the operation of the surface water drainage scheme throughout its lifetime.*

The development shall subsequently be completed, maintained and managed in accordance with the approved plan.

Reason: To ensure that management arrangements are in place for the sustainable drainage system in order to manage the risk of flooding and pollution during the lifetime of the development.

Please note United Utilities cannot provide comment on the management and maintenance of an asset that is owned by a third party management and maintenance company. We would not be involved in the discharge of the management and maintenance condition in these circumstances.

WATER AND WASTEWATER SERVICES

If the applicant intends to receive water and/or wastewater services from United Utilities, they should visit our website or contact the Developer Services team for advice. This includes seeking confirmation of the required metering arrangements for the proposed development.

If the proposed development site benefits from existing water and wastewater connections, the applicant should not assume that the arrangements will be suitable for the new proposal.

In some circumstances we may require a compulsory meter is fitted. For detailed guidance on whether the development will require a compulsory meter please visit <https://www.unitedutilities.com/my-account/your-bill/our-household-charges-20212022/> and go to section 7.7 for compulsory metering.

If reinforcement of the water network is required to meet potential demand, this could be a significant project and the design and construction period should be accounted for.

To avoid any unnecessary costs and delays being incurred by the applicant or any subsequent developer, we strongly recommend the applicant seeks advice regarding water and wastewater services, and metering arrangements, at the earliest opportunity. Please see 'Contacts' section below.

UNITED UTILITIES PROPERTY, ASSETS AND INFRASTRUCTURE

Where United Utilities' assets cross the proposed red line boundary, developers must contact our Developer Services team prior to commencing any works on site, including trial holes, groundworks or demolition. Please see 'Contacts' section below.

Water pipelines

United Utilities will not allow building over or in close proximity to a water main.

Wastewater pipelines

United Utilities will not allow a new building to be erected over or in close proximity to a public sewer or any other wastewater pipeline. This will only be reviewed in exceptional circumstances. *Nb. Proposals to extend domestic properties either above, or in close proximity to a public sewer will be reviewed on a case by case basis by either by a building control professional or following a direct application to United Utilities (see our website for further details).*

Important information regarding water and wastewater pipelines and apparatus

It is the applicant's responsibility to investigate and demonstrate the exact relationship between United Utilities' assets and the proposed development.

A number of providers offer a paid for mapping service, including United Utilities (see 'Contacts' section below). The position of the underground apparatus shown on water and wastewater asset maps is approximate only and is given in accordance with the best information currently available. Therefore, we strongly recommend the applicant, or any future developer, does not rely solely on the asset maps to inform decisions relating to the detail of their site and instead investigates the precise location of any underground pipelines and apparatus. Where additional information is requested to enable an assessment of the proximity of proposed development features to United Utilities assets, the proven location of pipelines should be confirmed by site survey; an extract of asset maps will not suffice. The applicant should seek advice from our Developer Services team on this matter. See 'Contacts' Section below. United Utilities Water will not accept liability for any loss or damage caused by the actual position of our assets and infrastructure being different from those shown on asset maps.

Developer's should investigate the existence and the precise location of water and wastewater pipelines as soon as possible as this could significantly impact the preferred site layout and/or diversion of the asset(s) may be required. Unless there is specific provision within the title of the property or an associated easement, any necessary disconnection or diversion of assets to accommodate development, will be at the applicant/developer's expense. In some circumstances, usually related to the size and nature of the assets impacted by proposals, developers may discover the cost of diversion is prohibitive in the context of their development scheme.

Any agreement to divert our underground assets will be subject to a diversion application, made directly to United Utilities. This is a separate matter to the determination of a planning application. We will not guarantee, or infer acceptance of, a proposed diversion through the planning process (where diversion is indicated on submitted plans). In the event that an application to divert or abandon underground assets is submitted to United Utilities and subsequently rejected (either before or after the determination of a planning application), applicants should be aware that they may need to amend their proposed layout to accommodate United Utilities' assets.

Where United Utilities' assets exist, the level of cover to United Utilities pipelines and apparatus must not be compromised either during or after construction and there should be no additional load bearing capacity on pipelines without prior agreement from United Utilities. This would include sustainable drainage features, earth movement and the transport and position of construction equipment and vehicles.

Any construction activities in the vicinity of United Utilities' assets, including any assets or infrastructure that may be located outside the applicant's red line boundary, must comply with national building and construction standards and where applicable, our 'Standard Conditions for Works Adjacent to Pipelines', a copy of which is available on our website. The applicant, and/or any subsequent developer should note that our 'Standard Conditions' guidance applies to any design and construction activities in close proximity to water pipelines and apparatus that are no longer in service, as well as pipelines and apparatus that are currently operational.

It is the applicant's responsibility to ensure that United Utilities' required access is provided within any proposed layout and that our infrastructure is appropriately protected. The developer would be liable for the cost of any damage to United Utilities' assets resulting from their activity.

WATER AND WASTEWATER SERVICES

If the applicant intends to receive water and/or wastewater services from United Utilities they should visit our website or contact the Developer Services team for advice at the earliest opportunity. This includes seeking confirmation of the required metering arrangements for the proposed development. See 'Contacts' Section below.

If the proposed development site benefits from existing water and wastewater connections, the applicant should not assume that the connection(s) will be suitable for the new proposal or that any existing metering arrangements will suffice. In addition, if reinforcement of the water network is required to meet potential demand, this could be a significant project and the design and construction period should be accounted for.

In some circumstances we may require a compulsory meter is fitted. For detailed guidance on whether the development will require a compulsory meter please visit <https://www.unitedutilities.com/my-account/your-bill/our-household-charges-20212022/> and go to section 7.7 for compulsory metering.

To promote sustainable development United Utilities offers a reduction in infrastructure charges for applicant's delivering water efficient homes and draining surface water sustainably (criteria applies). For further information, we strongly recommend the applicant visits our website when considering any water or wastewater design <https://www.unitedutilities.com/builders-developers/your-development/planning/building-sustainable-homes/>

Business customers can find additional information on our sustainable drainage incentive scheme at <https://www.unitedutilities.com/Business-services/retailers/incentive-schemes/>

To avoid any unnecessary costs and delays being incurred by the applicant or any subsequent developer, we strongly recommend the applicant seeks advice regarding water and wastewater services, and metering arrangements, at the earliest opportunity. Please see 'Contacts' Section below.

CONTACTS

Website

For detailed guidance on water and wastewater services, including application forms and the opportunity to talk to the Developer Services team using the '**Live Chat**' function, please visit: <http://www.unitedutilities.com/builders-developers.aspx>

Email

For advice on water and wastewater services or to discuss proposals near to pipelines, email the Developer Services team as follows:

Water mains and water supply, including metering - DeveloperServicesWater@uuplc.co.uk

Public sewers and drainage - WastewaterDeveloperServices@uuplc.co.uk

Telephone - 0345 072 6067

Property Searches (for asset maps):

A number of providers offer a paid for mapping service including United Utilities. For more information, or to purchase a sewer and water plan from United Utilities, please visit <https://www.unitedutilities.com/property-searches/>

Water and sewer records can be viewed for free at our Warrington Head Office by calling 0370 751 0101. Appointments must be made in advance. Public sewer records can be viewed at local authority offices. Arrangements should be made directly with the local authority.

We request that a copy of this letter is made available to the applicant.

Yours faithfully

The Planning, Landscape and Ecology Team

Knowsley Metropolitan Borough Council
Development Control
PO Box 26
Huyton
Liverpool
L36 9FB

Our ref: SO/2022/121966/03-L01
Your ref: 22/00099/FUL
Date: 20 July 2022

Dear Mark Quinn

ERECTION OF AN INDUSTRIAL/LOGISTICS BUILDING (USES B2, B8 AND E(G)(III)) WITH ANCILLARY OFFICES, SECURITY GATEHOUSE, TRANSPORT OFFICE AND ASSOCIATED WORKS.

FORMER CONTRACT CHEMICALS SITE, PENRHYN ROAD, KNOWSLEY BUSINESS PARK, KNOWSLEY, L34 9HY

Thank you for re-consulting us on the above application, on 07 July 2020.

Environment Agency Position

We have reviewed drawing 21065-BGL-XX-XX-DR-S-0203 Rev P3, and the document titled Response to EA letter dated 29 March (Reference: 21065-BGL-XX-XX-TN-D-00001, dated 24 May 2022,

Based on the additional information submitted we withdraw our previous objection on flood risk grounds but make the following comments and/or recommendations.

Contaminated Land Commentary

We have reviewed the Site Investigation Interpretative Report (Reference: G122, dated January 2022 ref G122) and note the previous use of the proposed development site presents a high risk of contamination that could be mobilised during construction to pollute controlled waters. Controlled waters are particularly sensitive in this location because the proposed development site is located adjacent to a surface watercourse and located upon a primary aquifer.

Considering the above, the proposed development will be acceptable if a planning condition is included requiring the submission of a remediation strategy. This should be carried out by a competent person in line with the National Planning Policy Framework (NPPF).

Without this condition we may object to the proposal in line with the NPPF because it cannot be guaranteed that the development will not be put at unacceptable risk from, or be adversely affected by, unacceptable levels of water pollution.

We note that the Knowsley Site Investigation Interpretative Report (Reference G122, dated January 2022) satisfies parts 1 and 2 of the below condition.

Additional ground investigation in the areas that were inaccessible during the site works reported here, particularly the areas beneath stockpiles, standing water and the warehouse that was undergoing demolition. This would likely involve the excavation of trial pits to allow the inspection and sampling of the upper soils, and subsequent

Environment Agency
Richard Fairclough House Knutsford Road, Warrington, WA4 1HT.
Customer services line: 03708 506 506
www.gov.uk/environment-agency

Cont/d..

chemical laboratory analysis. Such works could be undertaken as a validation exercise during any future remediation / earthworks, or as a standalone investigation.

The location, depth, and condition of the culverted Knowsley Brook must be confirmed.

Condition

No development approved by this planning permission shall commence until a remediation strategy to deal with the risks associated with contamination of the site in respect of the development hereby permitted, has been submitted to, and approved in writing by, the local planning authority. This strategy will include the following components:

1. A preliminary risk assessment which has identified:
 - all previous uses
 - potential contaminants associated with those uses
 - a conceptual model of the site indicating sources, pathways and receptors
 - potentially unacceptable risks arising from contamination at the site
 2. A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off-site.
 3. The results of the site investigation and the detailed risk assessment referred to in (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
 4. A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.
- Any changes to these components require the written consent of the local planning authority. The scheme shall be implemented as approved.

Reasons

- To ensure that the development does not contribute to and is not put at unacceptable risk from or adversely affected by, unacceptable levels of water pollution in line with the National Planning Policy Framework.
- To prevent deterioration of a water quality element to a lower status class in the underlying aquifer and the adjacent water course.

Advice to Local Planning Authority (LPA)

As the Environment Agency is unable to make detailed responses on technical reviews on all development sites in medium or low risk settings you may wish to consider that all site reports should meet a high standard and be confirmed as such by the National Quality Mark Scheme for Land affected by Contamination (NQMS), to enable confidence in conclusions on required remediation, based on adequate risk assessment practice.

The LPA may therefore wish to apply the condition below:

Condition

All submitted reports required by the land contamination conditions should be accompanied by an NQMS Declaration showing they have been reviewed by a registered SILC/SQP.

Reason

To demonstrate that reports have been compiled in accordance with best practice and recommendations and conclusions can be safely relied upon and that the reports authorship is by a suitably qualified person, as required by the NPPF, to ensure that the development does not contribute to unacceptable levels of environmental pollution from contamination sources at the development site in line with the NPPF.

Environmental permit - advice to applicant

Knowsley Brook is a designated main river. The requirement for a permit is entirely separate to planning permission. Please note that the documents submitted in support of removing this objection need to be submitted alongside any environmental permit application.

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- On or within 8 metres of a main river (16 metres if tidal)
- On or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
- On or within 16 metres of a sea defence
- Involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- In a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission

For further guidance please visit <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our National Customer Contact Centre on 03708 506 506.

The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

--

Should you have any queries regarding this response, please do not hesitate to contact me.

Yours sincerely,

Liza Willow
Planning Advisor

Liz.Willow@environment-agency.gov.uk

Hi Mark Quinn

Your planning application – No objection

After receiving the details of your planning application at

Former Contract Chemicals Site , Penrhyn Road, Knowsley Business Park, Knowsley.

we have completed our assessment.

We have **no objection** to your proposal from a planning perspective.

What you need to do

Please review our attached plans, which detail the Cadent gas asset/s in the area. If your application affects one of our high pressure pipelines, it is a statutory requirement that you input the details into the HSE's Planning Advice Web App. For further details, visit www.hse.gov.uk/landuseplanning/planning-advice-web-app.htm

The HSE may wish to apply more stringent criteria for building proximity after assessment. Please ensure that you formally consult with them before you proceed.

In order to help prevent damage to our asset/s, please add the following **Informative Note** into the **Decision Notice**:

Noise attenuation assessment to be noted for awareness if habitable buildings in close proximity near to the AGI

*Cadent Gas Ltd own and operate the gas infrastructure within the area of your development. **Prior to carrying out works, please register on www.lineearchbeforeudig.co.uk to submit details of the planned works for review, ensuring requirements are adhered to.***

The original holding objection was triggered due to the presence of a High Pressure Major Accident Hazard Pipeline (MAHP) and/or an Intermediate Pressure Pipeline and/or an Above Ground Installation.

- Cadent Gas has a **MAJOR ACCIDENT HAZARD PIPELINE** in the vicinity, (indicated in orange).). WINDLE/KIRBY
- Cadent Gas has a **INTERMEDIATE ACCIDENT HAZARD PIPELINE** in the vicinity, (indicated in Green). N/A
- Specific AGI BPD N/A

The minimum building proximity distance (BPD) for the pipelines and associated installations is as follows **15.5 M**

The building proximity distance taken from The Institution of Gas Engineers and Managers publication IGEM/TD/1 Edition 5 which is the standard applicable to steel pipelines and associated installations for high pressure gas transmission and IGEM/TD/3 Edition 5 Steel and PE pipelines for gas distribution

Your responsibilities and obligations

This letter does not constitute any formal agreement or consent for any proposed development work either generally or related to Cadent's easements or other rights, or any planning or building regulations applications.

Cadent Gas Ltd or their agents, servants or contractors do not accept any liability for any losses arising under or in connection with this information. This limit on liability applies to all and any claims in contract, tort (including negligence), misrepresentation (excluding fraudulent misrepresentation), breach of statutory duty or otherwise. This limit on liability does not exclude or restrict liability where prohibited by the law nor does it supersede the express terms of any related agreements.

If you need any further information or have any questions about the outcome, please contact us at plantprotection.nw@cadentgas.com / quoting your reference at the top of this letter.

Regards

Gareth Chadwick
North West O&M
Network Technician
Plant Protection



Mersey Road North, Failsworth, M35 9FF
07870856098
Gareth.chadwick@cadentgas.com

Notice of Leave 23rd May - 6th June

From: .Box.SiteVisits <box.SiteVisits@cadentgas.com>
Sent: 16 May 2022 09:10
To: .box.plantprotection.NW <plantprotection.NW@cadentgas.com>
Subject: FW: LSBUD Ref: 25630433 Your Ref: 22/00099/FUL (JH) Planning Application Holding Objection

Hey Team,

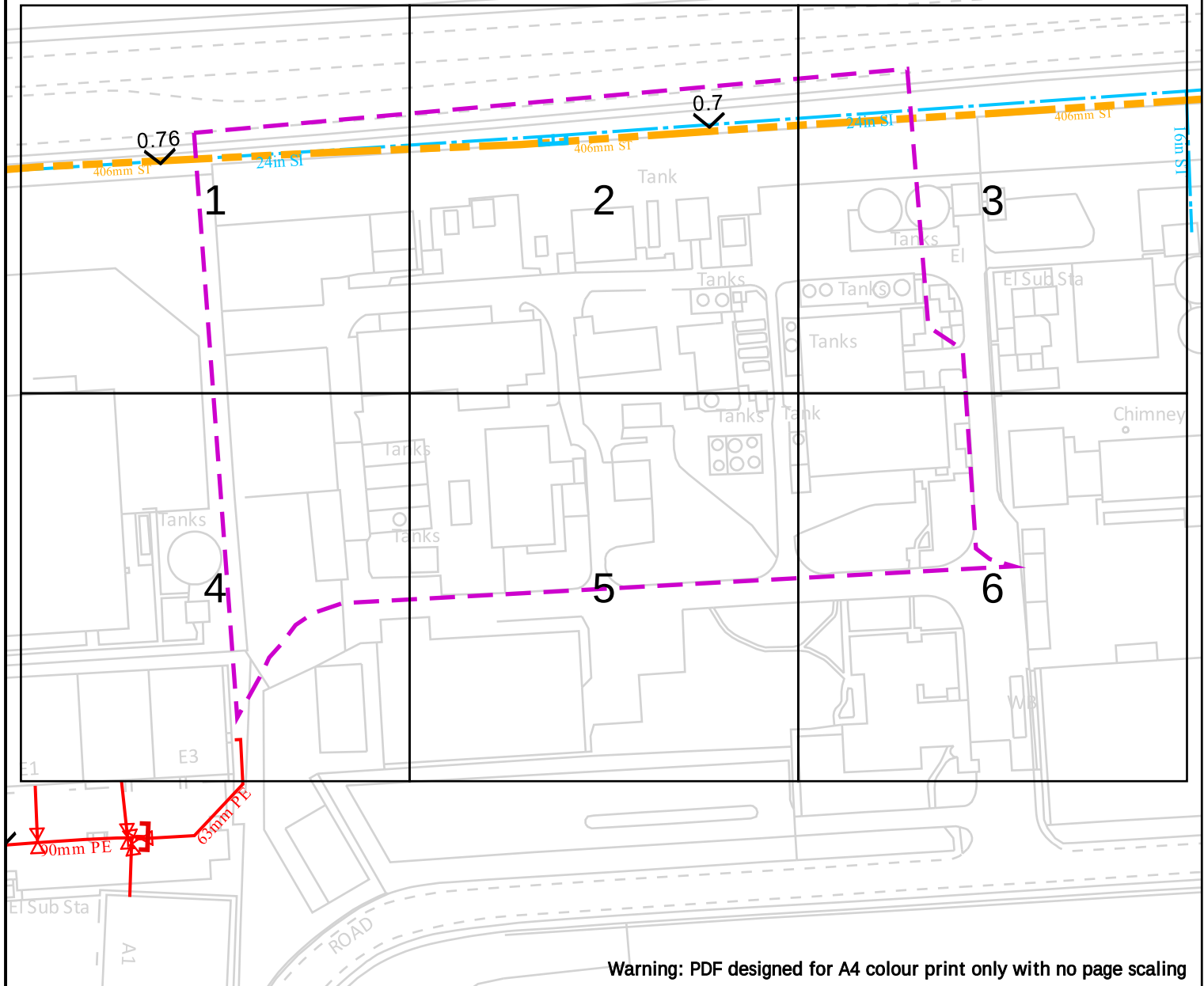
Please see below.

Kind Regards

Rachel Carruthers
Plant Protection

Cadent
Block 1 Floor 1
Brick Kiln Street
Hinckley, Leicestershire
LE10 0NA
Tel 0800 688 588
plantprotection@cadentgas.com
cadentgas.com

Overview map of worksite



Warning: PDF designed for A4 colour print only with no page scaling

Cadent
Your Gas Network

Dig Sites

Area:

Line:

LP Mains
 MP Mains
 IP Mains
 LHP Mains

Valve
 Depth of cover
 Syphon

Diameter Change

Material Change

Out of Standard Service

WARNING! This area contains Gas Mains Operating at High Pressure (in excess of 7 bar) and/or Intermediate Pressure (between 2 and 7 bar). Before excavating in the area contact the Plant Protection team on 0800 688 588 or plantprotection@cadentgas.com

Date Requested: 13/05/2022
Job Reference: 25630433
Site Location: 342956 396744
Requested by: Miss Jessica Hix

Your Scheme/Reference:
22/00099/FUL (JH)

View extent: 100m, 100m

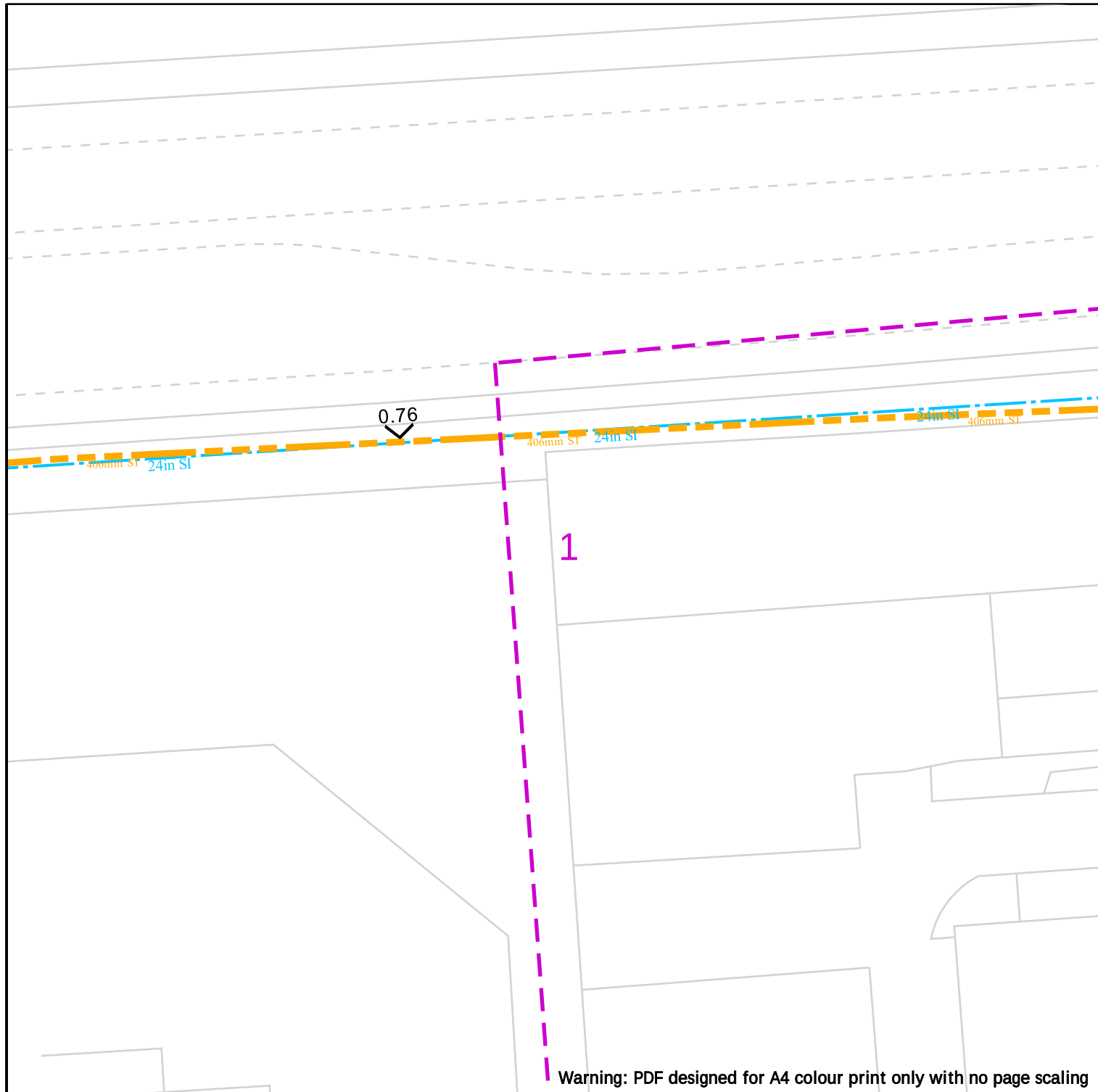
IMPORTANT NOTICES

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In case of emergency call - 0800 111 999

Scale: 1:1538 (When plotted at A4)

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Cadent
Your Gas Network

Date Requested: 13/05/2022
 Job Reference: 25630433
 Site Location: 342956 396744
 Requested by: Miss Jessica Hix

Your Scheme/Reference:
 22/00099/FUL (JH)

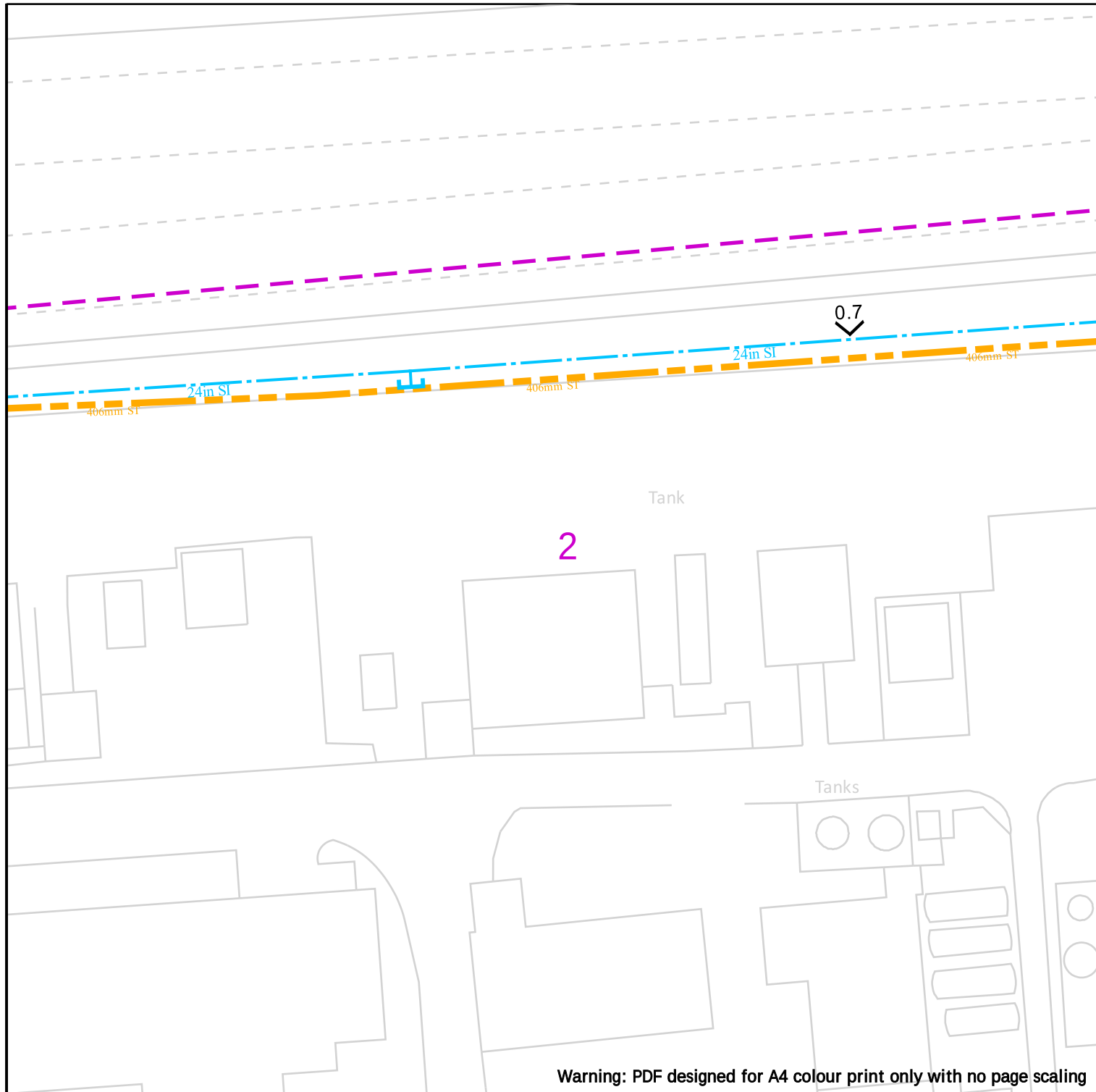
View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)



WARNING! This area contains Gas Mains Operating at High Pressure (in excess of 7 bar) and/or Intermediate Pressure (between 2 and 7 bar). Before excavating in the area contact the Plant Protection team on 0800 688 588 or plantprotection@cadentgas.com

Dig Sites 	Area: Line: 	Valve Depth of cover Syphon Diameter Change Material Change Out of Standard Service
IMPORTANT NOTICES This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.		
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25m

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Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Cadent
Your Gas Network

Date Requested: 13/05/2022
Job Reference: 25630433
Site Location: 342956 396744
Requested by: Miss Jessica Hix

Your Scheme/Reference:
22/00099/FUL (JH)

View extent: 100m, 100m

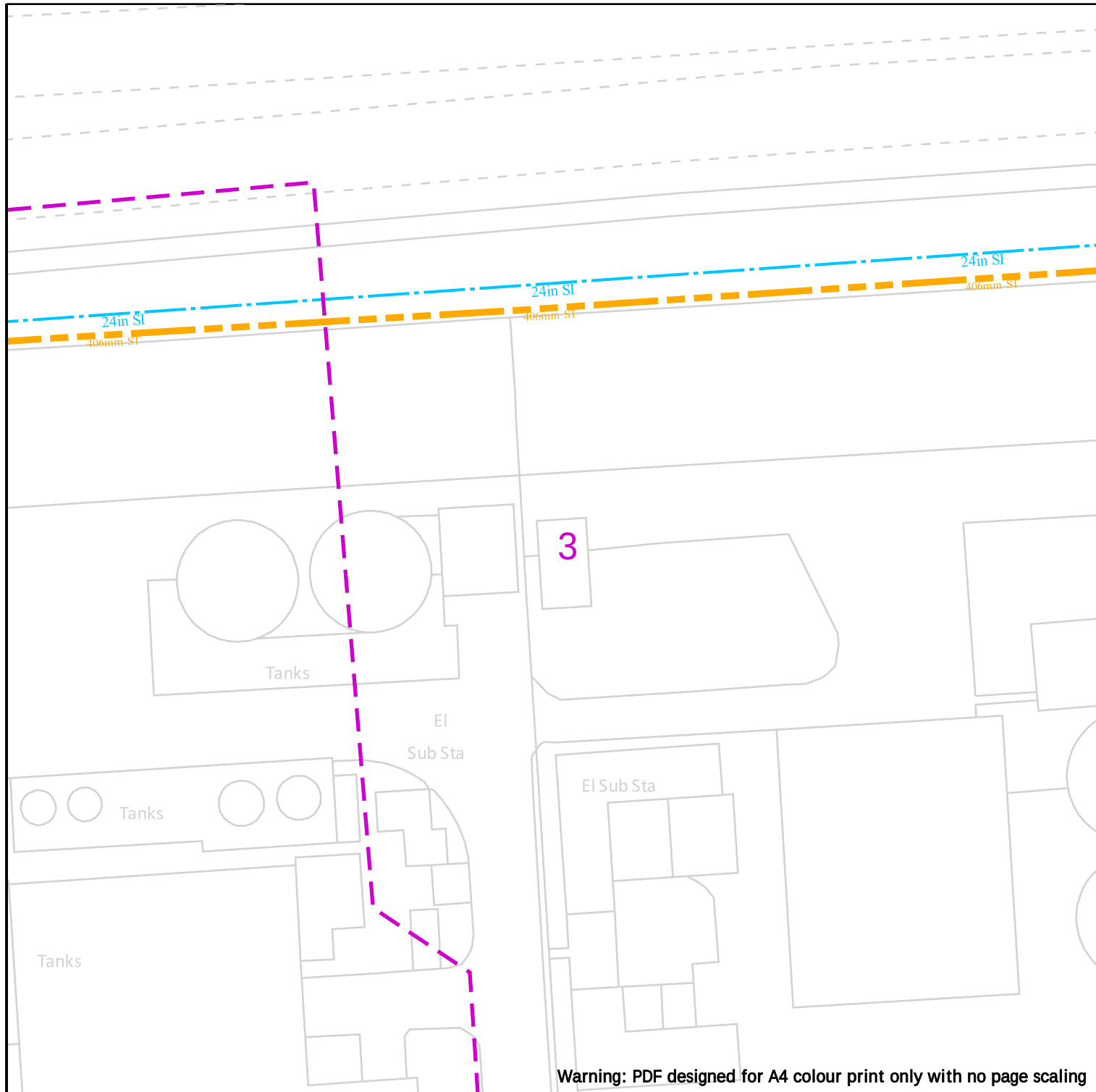
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Dig Sites

Area:

Line:

LP Mains
 MP Mains
 IP Mains
 LHP Mains

Valve
 Depth of cover
 Syphon

Diameter Change
 Material Change
 Out of Standard Service

Cadent
Your Gas Network

Date Requested: 13/05/2022
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View extent: 100m, 100m

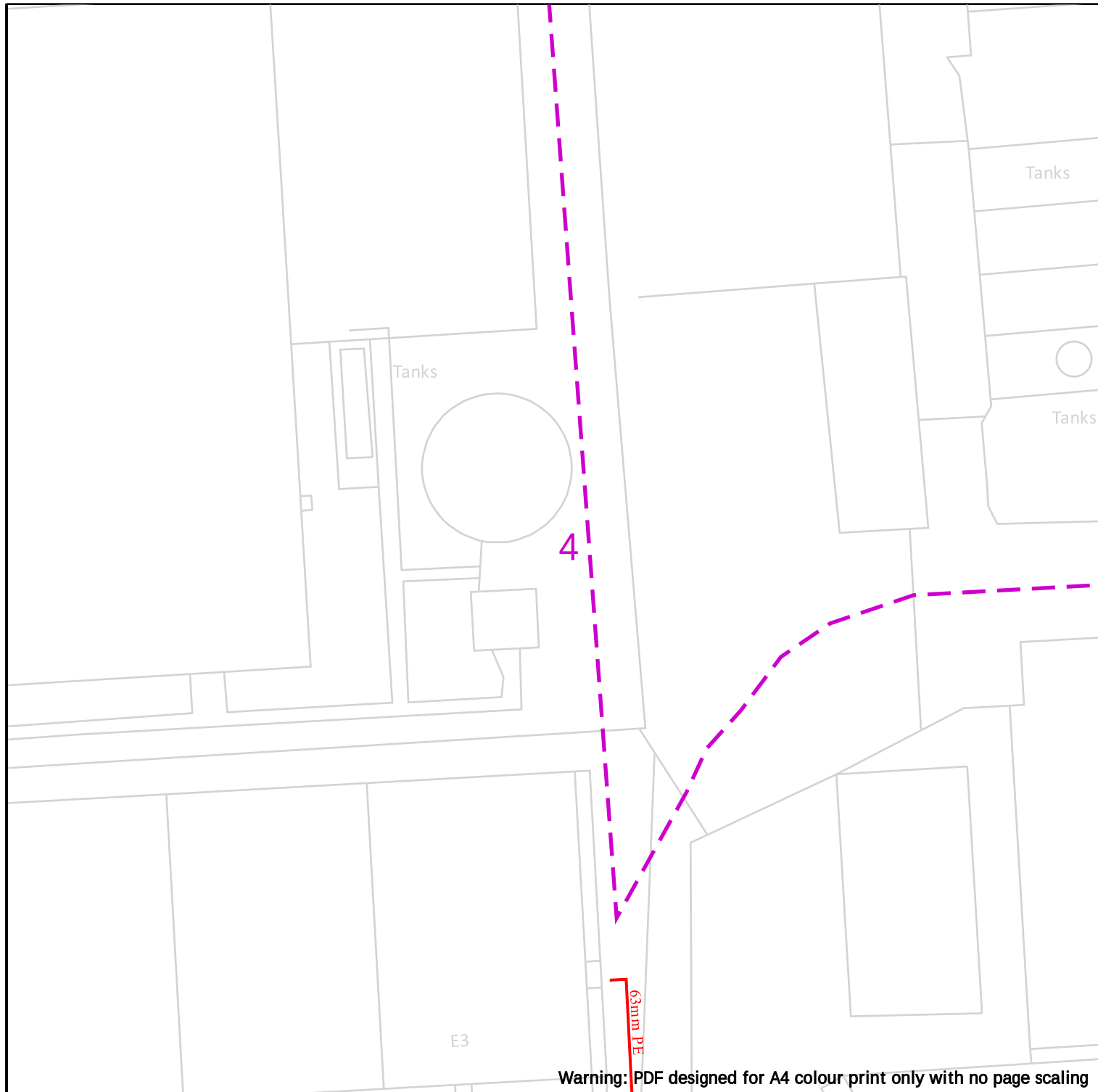
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Dig Sites

Area:

Line:

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Your Gas Network

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View extent: 100m, 100m

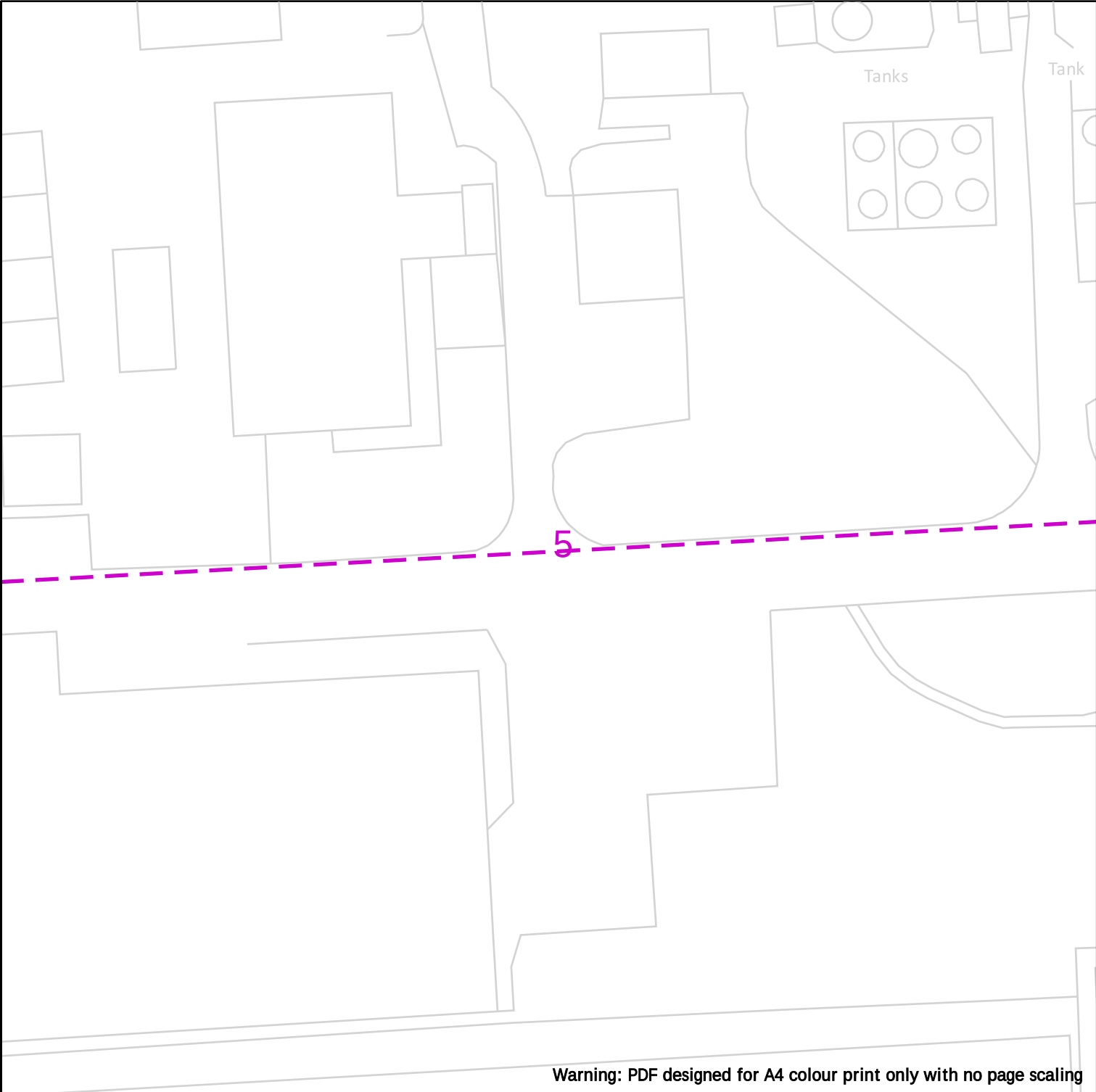
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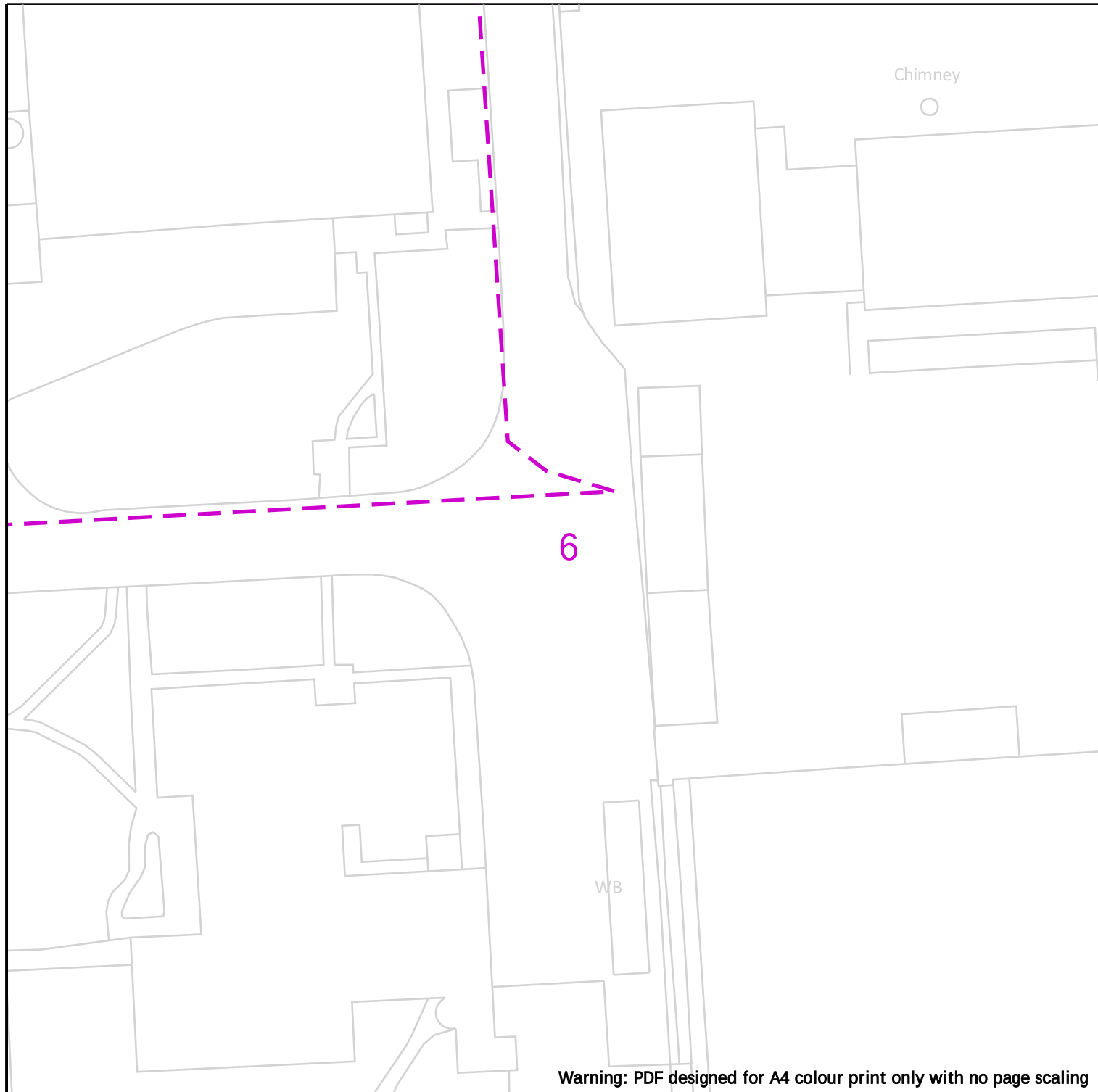
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 Your Gas Network	 Dig Sites Area:  Line:   LP Mains  MP Mains  IP Mains  LHP Mains  Valve  Depth of cover  Syphon  Diameter Change  Material Change  Out of Standard Service	WARNING! This area contains Gas Mains Operating at High Pressure (in excess of 7 bar) and/or Intermediate Pressure (between 2 and 7 bar). Before excavating in the area contact the Plant Protection team on 0800 688 588 or plantprotection@cadentgas.com
	Date Requested: 13/05/2022 Job Reference: 25630433 Site Location: 342956 396744 Requested by: Miss Jessica Hix Your Scheme/Reference: 22/00099/FUL (JH) View extent: 100m, 100m	IMPORTANT NOTICES This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue. In case of emergency call - 0800 111 999 Crown Copyright © - This plan is reproduced from or based on the OS map by Cadent Gas Limited, with the sanction of the controller of HM Stationary Office. Crown Copyright Reserved. Ordnance Survey Licence number 100024886



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Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service

Cadent
Your Gas Network

Date Requested: 13/05/2022
Job Reference: 25630433
Site Location: 342956 396744
Requested by: Miss Jessica Hix

Your Scheme/Reference:
22/00099/FUL (JH)

View extent: 100m, 100m

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In case of emergency call - 0800 111 999

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Enquirer

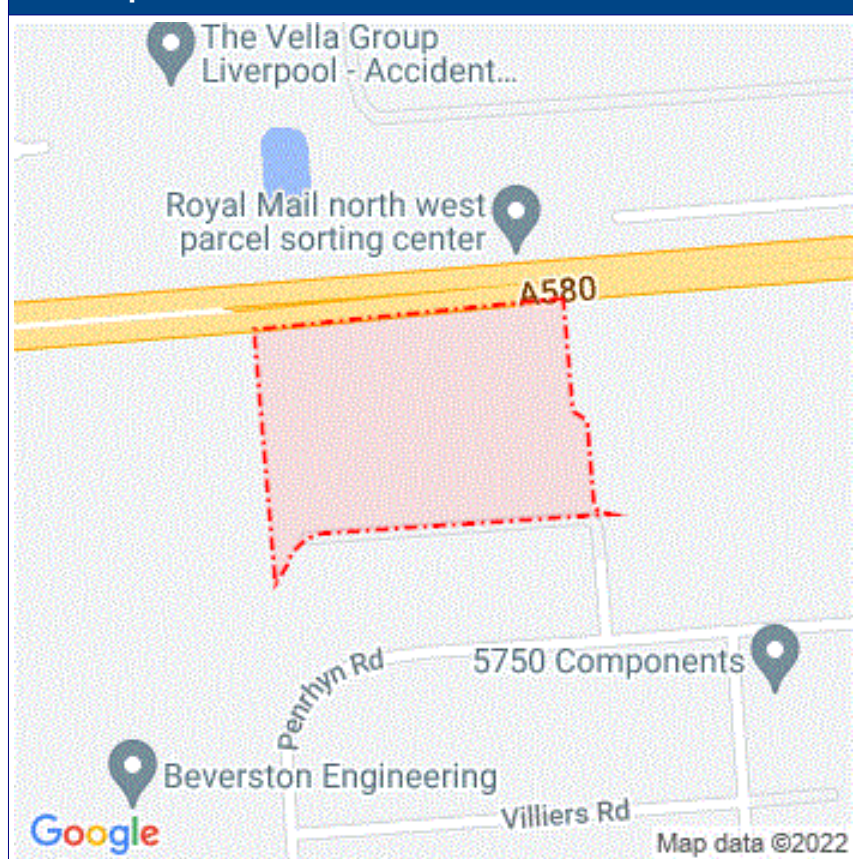
Name	Miss Jessica Hix	Phone	0800688588
Company	Cadent Gas Ltd	Mobile	0800688588
Address	Cadent Gas LTD Brick Kiln Street Hinckley Leicestershire LE10 0NA		
Email	cadent.planningapplications@cadentgas.com		

Enquiry Details

Scheme/Reference	22/00099/FUL (JH)		
Enquiry type	Planned Works	Work category	Planning Applications
Start date	10/06/2022	Work type	Multiple properties
End date	11/06/2022	Site size	24020 metres square
Searched location	XY= 342950, 396742	Work type buffer*	75 metres
Confirmed location	342956 396744		
Site Contact Name	Mark Quinn	Site Phone No	0151 489 6000
Description of Works	ERECTION OF INDUSTRIAL BUILDING, OFFICES, SECURITY GATEHOUSE, TRANSPORT OFFICE. Former Contract Chemicals Site , Penrhyn Road, Knowsley Business Park, Knowsley. dcconsultations@knowslev.aov.uk		

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.

Site Map



Asset Owners

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.lineasearchbeforeudig.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

Notes. Please ensure your contact details are correct and up to date on the system in case the LSBUD Members need to contact you.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LineasearchbeforeUdig accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Asset Owners & Responses. Please note the enquiry results include the following:

1. "LSBUD Members" who are asset owners who have registered their assets on the LSBUD service.
2. "Non LSBUD Members" are asset owners who have not registered their assets on the LSBUD service but LSBUD is aware of their existence. Please note that there could be other asset owners within your search area.

Below are three lists of asset owners:

1. LSBUD Members who have assets registered within your search area. ("Affected")
 - a. These LSBUD Members will either:
 - i. Ask for further information ("Email Additional Info" noted in status). The additional information includes: Site contact name and number, Location plan, Detailed plan (minimum scale 1:2500), Cross sectional drawings (if available), Work Specification.
 - ii. Respond directly to you ("Await Response"). In this response they may either send plans directly to you or ask for further information before being able to do so, particularly if any payments or authorisations are required.
2. LSBUD Members who do not have assets registered within your search area. ("Not Affected")
3. Non LSBUD Members who may have assets within your search area. Please note that this list is not exhaustive and all details are provided as a guide only. It is your responsibility to identify and consult with all asset owners before proceeding.

LSBUD Members who have assets registered on the LSBUD service within the vicinity of your search area.

List of affected LSBUD members			
Asset Owner	Phone/Email	Emergency Only	Status
Cadent Gas	0800688588	0800111999	Await response
Fulcrum Pipelines Limited	03330146455	0800111999	Not Notified
Last Mile	plantenquiries@lastmile-uk.com	0800111999	Not Notified
National Grid Electricity Transmission	01926654844	0800404090	Not Notified
Scottish and Southern Electricity Networks	08000483516	08000727282	Not Notified
SP Energy Networks	08452734444	08000929290 / 105	Not Notified

LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area. Please be aware that LSBUD Members make regular changes to their assets and this list may vary for new enquiries in the same area.

List of not affected LSBUD members		
AWE Pipeline	Balfour Beatty Investments Limited	BOC Limited (A Member of the Linde Group)
Box Broadband	BP Exploration Operating Company Limited	BPA
Carrington Gas Pipeline	CATS Pipeline c/o Wood Group PSN	Cemex
Centrica Storage Ltd	CNG Services Ltd	Concept Solutions People Ltd
ConocoPhillips (UK) Teesside Operator Ltd	D.S.Smith	Diamond Transmission Corporation
DIO (MOD Abandoned Pipelines)	DIO (MOD Live Pipelines)	E.ON UK CHP Limited
EirGrid	Electricity North West Limited	Energy Assets Pipelines
ENI & Himor c/o Penspen Ltd	EnQuest NNS Limited	EP Langage Limited
ESP Utilities Group	ESSAR	Esso Petroleum Company Limited
euNetworks Fiber UK Ltd	EXA Infrastructure	Exolum Pipeline System
Fulcrum Electricity Assets Limited	Gamma	Gas Networks Ireland (UK)
Gateshead Energy Company	Gigaclear Ltd	Harbour Energy
Heathrow Airport LTD	Humbly Grove Energy	IGas Energy
INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)	INOVYN ChlorVinyls Limited
INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)	Jurassic Fibre Ltd
Mainline Pipelines Limited	Manchester Jetline Limited	Manx Cable Company
Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited	Murphy Utility Assets
National Grid Gas Transmission	Neos Networks	Northumbrian Water Group
NPower CHP Pipelines	NTT Global Data Centers EMEA UK Ltd	NYnet Ltd
Oikos Storage Limited	Ørsted	Palm Paper Ltd
Perenco UK Limited (Purbeck Southampton Pipeline)	Petroineos	Phillips 66
Portsmouth Water	Premier Transmission Ltd (SNIP)	Redundant Pipelines - LPDA
RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)	RWEnpower (Little Barford and South Haven)	SABIC UK Petrochemicals
SAS Utility Services Ltd	Scottish Power Generation	Seabank Power Ltd
SES Water	SGN	Shell

Shell NOP	Squire Energy Networks	SSE Generation Ltd
SSE Transmission	SSE Utility Solutions Limited	Tata Communications (c/o JSM Construction Ltd)
Total Colnbrook Pipelines	Total Finaline Pipelines	Transmission Capital
UK Power Networks	Uniper UK Ltd	University of Cambridge Granta Backbone Network
Vattenfall	Veolia ES SELCHP Limited	Veolia ES Sheffield Ltd
Voneus Limited	VPI Power Limited	Wales and West Utilities
West of Duddon Sands Transmission Ltd	Western Power Distribution	Westminster City Council
Zayo Group UK Ltd c/o JSM Group Ltd		

The following Non-LSBUD Members may have assets in your search area. It is **YOUR RESPONSIBILITY** to contact them before proceeding. Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.

Non-LSBUD members (Asset owners not registered on LSBUD)			
Asset Owner	Preferred contact method	Phone	Status
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
ENGIE	nrsua.uk@engie.com	0800 130 3600	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@instalcom.co.uk	02087314613	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Sky UK Limited	nrsua@sky.uk	02070323234	Not Notified
Sota	SOTA.plantenquiries@instalcom.co.uk		Not Notified
Teliasonera	check-network@arelion.com	0800526015	Not Notified
United Utilities	WastewaterDeveloperServices@uuplc.co.uk	08707510101	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified

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