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By Email (chris.kendrick@civicengineers.com)

Dear Chris,

SUPPLEMENTARY GEOENVIRONMENTAL INVESTIGATION ANCOATS GREEN, JERSEY GREEN

1.1. BACKGROUND

E3P Ltd has been commissioned by Civic Engineers on behalf of Manchester City Council to undertake a supplementary Phase II Geoenvironmental Site Assessment of Ancoats Green, Jersey Green and Prussia Street Arm Greenway and associated Public Realm Improvements, which will herein be referred to as the 'Poland Street Zone' area. Specific interest is paid to an area of Jersey Street including the Jersey Street Bridge and further road sections East and West.

This report is required to determine potential contaminated land liabilities as part of potential future site redevelopment.

1.2. PROPOSED DEVELOPMENT

E3P understands that Civic Engineers are instructing works on behalf of Manchester City Council. The application site is bounded by Portugal Street to the north, Wadeford Close to the east, and the Rochdale Canal to the south in Ancoats, Manchester.

The proposals involve City Council improvements to the public realm within the Poland Street Zone as defined by the Poland Street Zone NDF and the Poland Street Zone Public Realm Strategy.

1.3. PREVIOUS REPORTS

The following reports have previously been completed for the site:

-  **E3P** – Phase I Geoenvironmental Site Assessment; Report Reference 15-798-R1-1; Dated; March 2022.
-  **E3P** – Phase II Geoenvironmental Site Assessment; Report Reference 15-798-R2-1; Dated; January 2023.

The key findings of the previous reports are summarised below and where necessary data is used to support the supplementary E3P geoenvironmental site assessment.

E3P – Phase I Geoenvironmental Site Assessment; Report Reference 15-798-R1-1; Dated; March 2022.

 Current Site Usage:

- The Jersey Street area is a rectangular subsection of the larger site including Jersey Street to the east of Poland Street. The site is bound by a concrete hardstanding car park to the north and a large warehouse to the south, currently unoccupied. To the southeast of the roadway, an area of undeveloped land is present in the former location of the Bengal Arm canal, predominantly concrete hardstanding from previous development with overgrown shrubs and vegetation around the periphery.

 Site History:

- No significant changes to Jersey Street have occurred since the earliest historical mapping records, with the Jersey Street bridge infilled circa 1955. From 1948, Jersey Street comprised the main carriageway running east-west with adjacent pavements. The Rochdale Canal runs parallel to the south of the road. The Jersey Street area is surrounded by significant industrial development, including the sheet metal works to the south-east, ironworks to the north-west and the waste paper factory to the south-west. Terraced residential housing is present to the east of Jersey Street.
- By 1963, significant further industrial development occurred surrounding Jersey Street including several various works and factories. By 2003, the majority of structures surrounding Jersey Street had been demolished and repurposed as car parking.

 Onsite Contamination Sources:

- Made Ground associated with multiple phases of development. Borehole data suggests an average of 2.50 m of Made Ground across the site - Heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), sulphates, Asbestos Containing Materials (ACM), TPHs and ground gas (carbon dioxide and methane).
- Made Ground and possible organic peat deposits associated with infilling of historical canal features. Heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), TPHs, Volatile contaminants, sulphates, Asbestos Containing Materials (ACM) and potential for ground gas (carbon dioxide and methane).
- Electricity Substations - Polychlorinated Biphenyls (PCBs) - Multiple have been identified across the site.

 Conclusions:

- The area of Jersey Street is likely to be underlain by significant depths of Made Ground, associated with the underlying infilled canal, ramps to the bridge and surrounding historic industrial development.
- The proposed demolition of the bridge and re-grading of the highway for a pedestrian walkway along Jersey Street is likely to cover the whole area with concrete and/or asphalt hardstanding.
- This will mitigate the risk of direct exposure of site users to underlying soils and therefore risk to human health is considered to be low. As no buildings or structures are proposed, risk for vapour/ground gas exposure and accumulation can be considered to be negligible. Contaminants have the potential to leach from the soil and migrate downwards to the underlying secondary B and principal bedrock aquifers, as well as the adjacent Rochdale Canal, and further investigation will be required to facilitate further risk assessment.

E3P – Phase II Geoenvironmental Site Assessment; Report Reference 15-798-R2-1; Dated; January 2023.

 Ground Conditions;

- Made Ground; Made Ground encountered along the western boundary in association with the former infilled canal (WS101, WS102, WS103, WS104, and WS106) comprised of reworked topsoil overlying interlayered gravelly sands and reworked gravelly clay. In WS105, also located along the western boundary, Made Ground comprised a grey gravel was encountered overlying gravels and reworked gravelly clay. Gravels of sandstone, mudstone, slate, brick, and concrete were encountered as well as fragments of glass, ceramic, tar, ash, and clinker were also encountered throughout the Made Ground. Hydrocarbon odours and sheens were encountered between 0.50 – 3.70 m bgl in WS101 to WS104. Due to limitations in access, the infilled canal was not fully investigated during the works and therefore the nature of the ground conditions is not fully understood and further investigation is required.
- Drift Geology; Drift deposits were encountered within the majority of exploratory locations with the exception of three locations where the full depth of Made Ground could not be proven. The drift deposits generally comprise a firm to stiff brown gravelly CLAY, with interbedded gravels of sandstone and mudstone.
- Solid Geology; Solid bedrock geology was not encountered in this investigation. The nearest BGS borehole 300 m northeast of the site records a red, brown and grey MUDSTONE at 36.88 m bgl.

 Contaminated Land Assessment

- The Tier 2 Human health risk assessment compared the data to the residential without plant uptake GAC levels.
- The assessment identified exceedances in heavy metals, PAH's and TPH Aromatic C10-C35 within the Made Ground to a maximum depth of 3.80 m bgl (WS101).
- TPH fractions were identified within Made Ground deposits in WS102, WS104 and WS106 likely in association with the infilled former canal along the western boundary.
- Naphthalene was encountered within the deeper Made Ground deposits of WS101, WS102, WS104, SA101, TP106, and TP105.
- Asbestos was not identified within any of the 13 samples sent for analysis.
- Six samples of Made Ground from depths between 0.20 – 3.00 m bgl were sent for waste classification. Three samples (WS101 0.20, WS102 0.70 and WS103 0.30) were non-hazardous and 3 samples (WS101 1.80, WS104 3.00 and WS105 1.20) were hazardous. The deeper deposits were hazardous compared to shallower deposits which came back non-hazardous.
- The controlled waters assessment identified elevated heavy metals, PAH and TPHs within the leachate and water samples taken from the site. The primary receptors are identified as the canal to the south and the underlying principal aquifer.
- The site is not located within a Groundwater Source protection Zone and there are no abstraction points within 1 km of the site, reducing the sensitivity of the receptor.
- Due to the exceedances of hydrocarbons noted in the soil, leachate and water samples, the risk to controlled waters is considered to be moderate. The identified contamination is likely associated with the infilled canal which is in conductivity with

the surface water network. It is recommended that further sampling is undertaken to inform a further detailed controlled waters risk assessment.

- No significantly elevated levels of ground gas have been recorded, and gas monitoring to date shows the site to be CS1. However, localised sources of ground gases are likely to be present, such as Made Ground associated with the infilled canal.

1.4. ENVIRONMENTAL SETTING

1.4.1. GEOLOGY AND HYDROGEOLOGY

The British Geological Survey (BGS) map for the site, (1:50,000, Solid and Drift editions) and online records indicate the site is underlain by the geological sequence presented in Table 1.1.

TABLE 1.1 SUMMARY OF UNDERLYING GEOLOGY

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION	AQUIFER CLASSIFICATION
Drift	Devensian Till - Diamicton	The drift deposits generally comprise a firm to stiff brown gravelly CLAY, with gravels of sandstone and mudstone.	Secondary Undifferentiated
Solid	Manchester Marls Formation	MUDSTONE	Secondary B
	Collyhurst Sandstone Formation	SANDSTONE	Principal

The Groundsure report indicates that the site is not located within a groundwater source protection zone. Furthermore, there are no active or historical groundwater, surface water or potable abstractions within 1 km of the site.

The Rochdale Canal is present and marks the southern boundary of the site. A historical arm of the canal, named the Bengal Arm, was infilled during the 1950s.

1.4.2. ANECDOTAL INFORMATION

1.4.3. JERSEY STREET BRIDGE

From: SA/2021/2 - Archaeological Desk-Based Study - Eliza Yard, Ancoats, Manchester - 2021

During the early 19th century, the Bengal Arm of the Rochdale Canal was constructed, which bounded the proposed development site to the north and east. Archaeological remains of the Bengal Arm of the Rochdale Canal may survive in-situ within the footprint of the site.

The canal was built in the early 19th century and opened in 1808.

By 1824, the Bengal Arm of the Rochdale Canal had been constructed. Bridges over the arm of the canal were constructed on Poland Street and Jersey Street.

The Bengal Arm was infilled in during the second half of the 20th century.

2. SUPPLEMENTARY GROUND INVESTIGATION

A supplementary ground investigation was undertaken with exploratory holes advanced to target specific potential contaminant sources identified during the previous ground investigation and to provide general coverage across the site.

Six window sample probeholes and three mechanically excavated trial trenches were advanced to confirm the ground conditions.

Exploratory fieldwork was completed on 24th May 2023. The works are summarised in Table 2.1.

2.1. SCOPE OF INVESTIGATION

TABLE 2.1 SUMMARY OF FIELDWORK

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE
General Ground Conditions	WS201	Window Sample Probehole	5.45	2.70 – 4.70
	WS202		5.45	1.20 – 5.20
General Ground Conditions/Infilled Canal	WS203		5.45	0.70 – 3.70
General Ground Conditions	WS204		5.45	1.70 – 4.70
	WS205		5.45	1.00 – 2.00
	WS206		5.45	1.50 – 4.50
Infilled Canal	TT101	Mechanically Excavated Trial Trench	4.10	N/A
	TT102		3.90	N/A
	TT103		3.90	N/A

Mechanically excavated trial trenches were advanced to investigate ground conditions in the location of the infilled canal and to retrieve environmental samples.

Window sample probeholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental samples and install groundwater and ground gas monitoring wells.

The sampling locations are illustrated in Drawing 15-798-005 (Appendix III). The ground conditions encountered are indicated on the logs, which are provided in Appendix V.

2.2. IN-SITU STANDARD PENETRATION TESTING (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60° cone (SPT(C)) was used instead of the sampling tube. The results are shown in the probehole logs in Appendix V and presented in Table 3.5.

2.3. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical analyses comprising:

-  Metals.
-  pH, total sulphate, water-soluble sulphate (2:1 extract).
-  Sulphide.
-  Cyanide.
-  Phenols.
-  Total and speciated polycyclic aromatic hydrocarbons (PAHs).
-  Semi Volatile Organic Compounds (SVOC).
-  Volatile Organic Compounds (VOC).
-  Asbestos identification and quantification.
-  Speciated and banded total petroleum hydrocarbon (TPH).
-  Total Organic Carbon (TOC).

I2 Analytical undertook the analytical work and the testing results are included in Appendix VI and discussed in Section 4.

3. GROUND AND GROUNDWATER CONDITIONS

3.1. SUMMARY OF GROUND CONDITIONS

The ground investigation identified the strata set out in Table 3.1 below.

TABLE 3.1 SUMMARY OF STRATA

HOLE	DEPTH TO STRATUM (m bgl)			
	MADE GROUND TOPSOIL	MADE GROUND	FIRM TO STIFF CLAY	SOFT CLAY
WS201	0.00-0.30	0.30-2.50	2.50-5.45	-
WS202	0.00-0.30	0.30-1.10	1.10-5.45	-
WS203	0.00-0.30	0.30-4.20	4.20-5.45	-
WS204	0.00-0.30	0.30-1.50	1.50-5.45	-
WS205	0.00-0.30	0.30-2.00	2.00-5.45	-
WS206	0.00-0.30	0.30-0.80	2.00-5.45	0.80-2.00
TT101	0.00-0.30	0.30-3.90	3.90-4.10	-
TT102	0.00-0.30	0.30-3.90	-	-
TT103	0.00-0.30	0.30-3.90	-	-

3.2. TOPSOIL (REWORKED)

Reworked topsoil was encountered within all exploratory hole locations to 0.30 m bgl.

Topsoil generally comprises dark brown sandy gravelly clay with frequent rootlets and gravel of sandstone, mudstone, brick and ceramic.

3.3. MADE GROUND

Made Ground deposits were encountered within all exploratory hole locations to depths of between 0.80 m bgl and 4.20 m bgl (WS203). The base of the Made Ground was not proven in the trial trenches TT102 and TP103, with Made Ground identified to depths in excess of 3.90 m bgl.

Made Ground in the location of the infilled canal generally comprises reworked topsoil overlying brown slightly clayey very sandy gravel to circa 2.20 m bgl and dark brown to black very sandy very gravelly clay to 3.60 – 4.20 m bgl. In TT102 and TT103 this was underlain by grey sandy gravelly clay to 3.90 m bgl. The gravel has continents of sandstone, mudstone, concrete and brick and the clay has constituents of metal, glass, wood, ceramic, tar, ash and rubber refuse material. A strong hydrocarbon odour was noted within all three trial trenches in this location.

Across the remainder of the site (central and eastern sectors) Made Ground generally comprised reworked topsoil overlying sandy gravel followed by a reworked gravelly clay to depths of between 0.80 m and 2.50 m bgl . Gravels of sandstone, mudstone, limestone, brick and concrete were encountered as well as fragments of glass, ceramic, metal, timber, and plastic throughout this layer.

3.4. DRIFT DEPOSITS

Drift deposits were encountered between 0.80 m bgl and 5.45 m bgl. Drift deposits were encountered within the majority of exploratory locations with the exception of two locations where the full depth of Made Ground could not be proven (TT102 and TT103).

The drift deposits generally comprise firm to stiff brown gravelly CLAY with gravel of sandstone and mudstone.

Soft very low strength CLAY was identified in WS206 between 0.80 m and 2.00 m bgl.

3.5. SOLID GEOLOGY

The solid bedrock geology was not encountered during the supplementary ground investigation. The nearest BGS borehole 300 m northeast of the site records red, brown and grey MUDSTONE at 36.88 m bgl.

3.6. GROUNDWATER

Groundwater strikes were encountered as seepages. The depth of the seepages are shown on the exploratory hole records in Appendix V and are summarised in Table 3.2.

TABLE 3.2 SUMMARY GROUNDWATER STRIKES

LOCATION	DEPTH TO STRIKE (m)	NOTES
TT101	3.50	Steady ingress
TT101	3.90	Steady ingress
TT102	2.20	Rapid ingress from 2.20 m bgl
TT103	2.70	Rapid ingress from 2.70 m bgl
WS203	3.00	Seepage

3.7. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has been identified during the site investigation and these are summarised in Table 3.3.

TABLE 3.3 SUMMARY VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

LOCATION	DEPTH (m)	STRATUM	NOTES
TT101	2.20	Made Ground	Strong hydrocarbon odour/sheen
TT102	2.20	Made Ground	Strong hydrocarbon odour/sheen
TT103	2.20	Made Ground	Strong hydrocarbon odour/sheen

3.8. SOIL CONSISTENCY

Undrained shear strength values were measured using field hand shear vane tests. Results of the tests are presented in Table 3.4 which indicate the clay soils in TT101 to be firm. Strength test data is generally consistent with the field descriptions of the aforementioned soils.

Results of the standard penetration tests, including undrained shear strengths derived from SPTs are included in Table 3.5.

TABLE 3.4 SUMMARY OF HAND SHEAR VANE TESTS

LOCATION	DEPTH	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)
TT101	4.00	70	161

TABLE 3.5 STANDARD/CONE PENETRATION TEST RESULTS

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS201	1.00	MADE GROUND: Black slightly clayey very sandy gravel.	22	22.18	Medium Dense	N/A	N/A	N/A	221.79
WS201	2.00	MADE GROUND: Black slightly clayey very sandy gravel.	20	18.27	Medium Dense	N/A	N/A	N/A	182.71
WS201	3.00	Slightly sandy slightly gravelly CLAY.	22	19.13	N/A	High strength	Very Stiff	95.66	196.68
WS201	4.00	Slightly sandy slightly gravelly CLAY.	25	21.12	N/A	High strength	Very Stiff	105.61	217.13
WS201	5.00	Slightly sandy slightly gravelly CLAY.	29	24.06	N/A	High strength	Very Stiff	120.30	247.33
WS202	1.00	MADE GROUND: Grey very gravelly fine to coarse sand.	22	22.18	Medium Dense	N/A	N/A	N/A	221.79
WS202	2.00	Sandy slightly gravelly CLAY.	22	20.10	N/A	High strength	Very Stiff	100.49	206.61

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS202	3.00	Sandy slightly gravelly CLAY.	23	20.00	N/A	High strength	Very Stiff	100.01	205.62
WS202	4.00	Sandy slightly gravelly CLAY.	26	21.97	N/A	High strength	Very Stiff	109.83	225.81
WS202	5.00	Sandy slightly gravelly CLAY.	28	23.23	N/A	High strength	Very Stiff	116.15	238.80
WS203	1.00	MADE GROUND: Brown slightly clayey very sandy gravel.	17	17.14	Medium Dense	N/A	N/A	N/A	171.39
WS203	2.00	MADE GROUND: Brown slightly clayey very sandy gravel.	8	7.31	Loose	N/A	N/A	N/A	73.08
WS203	3.00	MADE GROUND: Blackish brown very sandy very gravelly clay.	6	5.22	Loose	N/A	N/A	N/A	52.18
WS203	4.00	MADE GROUND: Blackish brown very sandy very gravelly clay.	17	14.36	Medium Dense	N/A	N/A	N/A	143.62
WS203	4.00	Slightly sandy slightly gravelly CLAY.	17	14.36	N/A	Medium strength	Stiff	71.81	147.65

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS203	5.00	Slightly sandy slightly gravelly CLAY.	23	19.08	N/A	High strength	Very Stiff	95.41	196.16
WS204	1.00	MADE GROUND: Black very gravelly fine to coarse sand.	8	8.07	Loose	N/A	N/A	N/A	80.65
WS204	2.00	Slightly sandy slightly gravelly CLAY.	17	15.53	N/A	High strength	Very Stiff	77.65	159.65
WS204	3.00	Slightly sandy slightly gravelly CLAY.	22	19.13	N/A	High strength	Very Stiff	95.66	196.68
WS204	4.00	Slightly sandy slightly gravelly CLAY.	23	19.43	N/A	High strength	Very Stiff	97.16	199.76
WS204	5.00	Slightly sandy slightly gravelly CLAY.	29	24.06	N/A	High strength	Very Stiff	120.30	247.33
WS205	1.00	MADE GROUND: Black very gravelly fine to coarse sand.	5	5.04	Loose	N/A	N/A	N/A	50.41

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS205	2.00	Slightly sandy slightly gravelly CLAY.	9	8.22	N/A	Medium strength	Stiff	41.11	84.52
WS205	3.00	Slightly sandy slightly gravelly CLAY.	22	19.13	N/A	High strength	Very Stiff	95.66	196.68
WS205	4.00	Slightly sandy slightly gravelly CLAY.	24	20.28	N/A	High strength	Very Stiff	101.38	208.44
WS205	5.00	Slightly sandy slightly gravelly CLAY.	27	22.40	N/A	High strength	Very Stiff	112.00	230.27
WS206	1.00	Slightly sandy slightly gravelly CLAY.	3	3.02	N/A	Very low strength	Soft	15.12	31.09
WS206	2.00	Slightly sandy slightly gravelly CLAY.	20	18.27	N/A	High strength	Very Stiff	91.35	187.82
WS206	3.00	Slightly sandy slightly gravelly CLAY.	17	14.78	N/A	Medium strength	Stiff	73.92	151.98
WS206	4.00	Slightly sandy slightly gravelly CLAY.	22	18.59	N/A	High strength	Very Stiff	92.93	191.07

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS206	5.00	Slightly sandy slightly gravelly CLAY.	25	20.74	N/A	High strength	Very Stiff	103.70	213.21

NOTES

* The Allowable Bearing Pressure (ABP) should be considered indicative.

The interpretation of in situ mass undrained shear strength (cu) data from SPT Blow Count (N) results and the influence of the Plasticity Index (PI) was reported in Standard Penetration Test in Insensitive Clays and Soft Rocks. Stroud (1974). The standard penetration test and the engineering properties of glacial materials subsequently. Stroud and Butler (1975) and (1989).

Allowable bearing pressure on sands. Soil Mechanics in Engineering Practice Terzaghi, K. & Peck, R.B. 1996.

3.9. PH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained (summarised in Table 3.6), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).

Elevated sulphate concentrations meeting Class DS-2, AC-1s were noted in TT101 at 3.50 m bgl.

TABLE 3.6 SUMMARY OF pH AND SULPHATE DATA

LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
TT101	0.50	0.0061	8.6	DS-1, AC-1s
TT101	3.50	0.82	7.5	DS-2, AC-1s
TT101	4.10	0.02	8.7	DS-1, AC-1s
TT102	1.00	0.018	8.4	DS-1, AC-1s
TT102	3.60	0.35	7.9	DS-1, AC-1s
TT103	0.50	0.052	8.5	DS-1, AC-1s
TT103	2.30	0.41	7.8	DS-1, AC-1s
TT103	3.90	0.0068	8.6	DS-1, AC-1s

4. SUPPLEMENTARY TIER I QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 2 qualitative risk assessment to determine if any potential contaminants within the underlying soils pose an unacceptable level of risk to the identified receptors.

4.1. HUMAN HEALTH RISK ASSESSMENT

At Tier 1 stage, the long term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

Where Tier 2 screening values are not provided by LQM, other screening values have been used and these are referenced in Table 4.1.

The results of this comparison have been summarised within Table 4.1.

TABLE 4.1 SUMMARY OF INORGANIC AND HYDROCARBON TOXICITY ASSESSMENT FOR PUBLIC OPEN SPACE END USE

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Arsenic	mg/kg	170	8	82	-	1	No Further Action
Cadmium	mg/kg	532	3	2.7	-	1	No Further Action
Chromium (VI)	mg/kg	220	8	<1.8	-	1	No Further Action
Lead***	mg/kg	1300	8	520	-	1	No Further Action
Mercury**	mg/kg	30	5	2.5	-	2	No Further Action
Nickel	mg/kg	800	8	150	-	1	No Further Action
Selenium	mg/kg	1800	1	2.1	-	1	No Further Action
Copper	mg/kg	44000	8	480	-	1	No Further Action
Zinc	mg/kg	170000	8	1100	-	1	No Further Action
Cyanide – Total	mg/kg	791	8	8.1	-	1	No Further Action
Phenols – Total	mg/kg	210	8	3.8	-	1	No Further Action
Asbestos	Fibres	NFD	6	NFD	-	4	No Further Action
Naphthalene	mg/kg	1200	8	140	-	2	No Further Action
Acenaphthylene	mg/kg	29000	8	31	-	3	No Further Action
Acenaphthene	mg/kg	29000	8	54	-	1	No Further Action
Fluorene	mg/kg	20000	8	66	-	1	No Further Action
Phenanthrene	mg/kg	6200	8	260	-	3	No Further Action
Anthracene	mg/kg	150000	8	77	-	3	No Further Action
Fluoranthene	mg/kg	6300	8	440	-	3	No Further Action
Pyrene	mg/kg	15000	8	450	-	3	No Further Action
Benzo(a)Anthracene	mg/kg	49	8	210 85	TT101 3.5m TT103 2.3m	3	Further Action



DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Chrysene	mg/kg	93	8	190 77	TT101 3.5m TT103 2.3m	3	Further Action
Benzo(b)Fluoranthene	mg/kg	13	8	180 71 16	TT101 3.5m TT103 2.3m TT102 3.6m	3	Further Action
Benzo(k)Fluoranthene	mg/kg	370	8	62	-	3	No Further Action
Benzo(a)Pyrene	mg/kg	11	8	170 70 15	TT101 3.5m TT103 2.3m TT102 3.6m	3	Further Action
Indeno(123-cd)Pyrene	mg/kg	150	8	71	-	3	No Further Action
Dibenzo(a,h)Anthracene	mg/kg	1.1	8	19 8.9 1.8 1.3	TT101 3.5m TT103 2.3m TT102 3.6m TT102 1.0m	3	Further Action
Benzo(ghi)Perylene	mg/kg	1400	8	91	-	3	No Further Action
TPH C5-C6 (aliphatic)	mg/kg	95000	3	<0.001	-	2	No Further Action
TPH C6-C8 (aliphatic)	mg/kg	150000	3	<0.001	-	2	No Further Action
TPH C8-C10 (aliphatic)	mg/kg	14000	3	<0.001	-	2	No Further Action
TPH C10-C12 (aliphatic)	mg/kg	21000	3	9.5	-	2	No Further Action
TPH C12-C16 (aliphatic)	mg/kg	25000	3	33	-	1	No Further Action
TPH C16-C35 (aliphatic)	mg/kg	450000	3	591	-	1	No Further Action
TPH C5-C7 (aromatic)	mg/kg	76000	3	<0.001	-	1	No Further Action
TPH C7-C8 (aromatic)	mg/kg	87000	3	<0.001	-	2	No Further Action
TPH C8-C10 (aromatic)	mg/kg	7200	3	<0.001	-	2	No Further Action
TPH C10-C12 (aromatic)	mg/kg	9200	3	100	-	2	No Further Action
TPH C12-C16 (aromatic)	mg/kg	10000	3	260	-	2	No Further Action
TPH C16-C21 (aromatic)	mg/kg	7600	3	560	-	1	No Further Action
TPH C21-C35 (aromatic)	mg/kg	7800	3	740	-	1	No Further Action
TPH C5-C6 (aliphatic)*	mg/kg	95000	5	<1.0	-	2	No Further Action
TPH C6-C8 (aliphatic)*	mg/kg	150000	5	0.2	-	2	No Further Action
TPH C8-C10 (aliphatic)*	mg/kg	14000	5	0.3	-	2	No Further Action
TPH C10-C12 (aromatic)*	mg/kg	9200	5	10	-	2	No Further Action
TPH C12-C16 (aromatic)*	mg/kg	10000	5	93	-	2	No Further Action
TPH C16-C21 (aromatic)*	mg/kg	7600	5	750	-	1	No Further Action
TPH C21-C35 (aromatic)*	mg/kg	7800	5	1200	-	1	No Further Action
Benzene	mg/kg	90	3	0.083	-	2	No Further Action
Toluene	mg/kg	87000	3	0.084	-	2	No Further Action
Ethylbenzene	mg/kg	17000	3	0.11	-	2	No Further Action
p & m-Xylene	mg/kg	17000	3	0.15	-	2	No Further Action



DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
o-Xylene	mg/kg	17000	3	0.098	-	2	No Further Action
1,2,4-Trimethylbenzene****	mg/kg	225	3	0.081	-	2	No Further Action

Notes

Main Exposure Pathways: 1 = Soil Ingestion, 2 = Vapour Inhalation (indoor), 3 = Dermal Contact & Ingestion, 4 = Dust Inhalation.
Abbreviations: GAC = General Assessment Criteria, n = number of samples, MC = Maximum Concentration; Loc of Ex = Location of Exceedance; NFD = No Fibres Detected

* The Tier 1 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 1 values for aliphatic compounds for the volatile and semi volatile fractions (C₅-C₁₂) and the Tier 1 values for aromatic compound for the non-volatile fractions (C₁₂-C₃₅). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.

**Based on Elemental Mercury

***CL:AIRE C4SL

****ATRISK

Referring to Table 1.3, the result of this direct comparison indicates that the data exceeds the screening criteria for a public open space end use for the following contaminants:

- ☛ Non-volatile PAHs (Benzo(a)Anthracene, Chrysene, Benzo(b)Fluoranthene, Benzo(a)Pyrene, Dibenzo(a,h)Anthracene)

A number of SVOCs were identified above the limit of detection in TT102 at 3.60 m bgl and TT103 at 2.30 m bgl (including aniline, 2-methylnaphthalene, carbazole, anthraquinone and dibenzofuran), however no screening criteria is available. These are not considered to pose a risk within the context of the developed CSM.

1,3,5-Trimethylbenzene was also identified above the limit of detection in TT103 at 2.30 m bgl. No screening criteria is available, however the minimal concentration (0.03 mg/kg) is not considered to pose a risk to future site users.

Asbestos was not detected in any of the samples analysed.

In relation to these exceedances, the following can be determined:

- ☛ The main exposure pathways based on the Tier I exceedances are:
 - Soil ingestion;
 - Dermal contact and ingestion;

4.1.1. HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

The identified elevated concentrations have primary exposure pathways related to dermal contact and ingestion of soils. The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAH compounds can be mitigated through either hardstanding or the installation of a suitable cover system in all proposed landscaped areas and public open space to remove any potential for direct exposure to impacted soils.

The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy.



4.2. CONTROLLED WATERS RISK ASSESSMENT

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 4.2.

TABLE 4.2 CONTROLLED WATERS CONCEPTUAL MODEL AND SENSITIVITY PROFILE

DISCUSSION		SENSITIVITY RATING
Contaminant Source		
Made Ground Heavy metals and PAH contamination is present within Made Ground across the site as a result of infill material from historical features on-site Including the former canal, housing and Wharf.		High
Infilled Canal The infilled canal along the western boundary of the site is a potential source of mobile contamination.		High
Pathway		
Vertical Migration The site is underlain by cohesive CLAY deposits. The presence of this low permeability drift will offer some protection to the underlying aquifer.		Low
Lateral migration The site is underlain by cohesive CLAY deposits restricting lateral migration of contaminants across the site.		Low
Receptor		
Aquifer Classification in Superficial Drift Deposits	Secondary undifferentiated	Low
Aquifer Classification in Bedrock	Principal aquifer Secondary B	High
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not affected	Low
Distance to the Closest Groundwater Abstraction Point	None were identified within a 1 km radius.	Low
Is the Site Located Within 50 m of a Surface Watercourse?	The Rochdale Canal is 30 m south of the site.	High
The ICSM developed within the context of the site setting has identified a viable pollutant pathway, which would be the lateral migration of potentially mobile phase-soluble contaminants towards the Rochdale Canal, which lies circa 30 m south of the site.		



To ensure a robust appraisal of the identified risk to controlled waters, E3P has identified the sources of potential contamination that represent a risk to controlled waters from the initial CSM, we have then assessed the availability of ground investigation data in the form of analysis of the solid phase (soil) and dissolved phase within the perched groundwater or aquifer. The results of this assessment are presented in Table 4.3.

TABLE 4.3 QUALITATIVE RISK TO CONTROLLED WATERS FROM SOIL ANALYTICAL RESULTS

CONTAMINANT	ASSESSMENT RATING	DISCUSSION
BTEX > 1 mg/kg	The soil data analysis has not identified any detectable concentrations of VOCs above 1mg/kg or TPH C5 to C6 that might otherwise be indicative of VOC impact.	None
Total VOC > 1 mg/kg		
Total SVOC > 1 mg/kg	SVOCs have been identified above 1 mg/kg in samples TT102 at 3.60 m bgl and TT103 at 2.30 m bgl.	Further discussion
C5-C10 > 5 mg/kg	All concentrations are below the laboratory LOD.	None
C10-C12 > 10 mg/kg	Concentrations are above 10 mg/kg in samples TT102 3.60 m and TT103 2.30 m bgl.	Further discussion
C12-C16 > 50 mg/kg	The soil data analysis has identified concentrations of C12-C16 above 50 mg/kg. The maximum concentration is 260 mg/kg in TT103 at 2.30 m bgl.	Further discussion
Phenols > 2 mg/kg	Phenols are above 2 mg/kg in TT103 at 2.30 m bgl.	Further discussion
Naphthalene > 2 mg/kg	Concentrations of naphthalene above 2 mg/kg have been recorded. The maximum concentration is 140 mg/kg in TT103 at 2.30 m bgl.	Further discussion
Total PAH > 10 mg/kg	Total concentrations of low-solubility PAH compounds greater than 10 mg/kg have been detected throughout the site, with a maximum concentration recorded in TT101 at 3.50 m bgl with a concentration of 2250 mg/kg.	Further discussion
PCB > 1 mg/kg	No potential sources of PCB have been identified.	None
Heavy metals > 500 mg/kg	The soil data analysis has identified concentrations of heavy metals above 500 mg/kg in TT101 at 3.50 m bgl.	Further discussion

In due consideration of the site CSM which has identified a potential pollutant linkage associated with lateral migration towards the canal, E3P has undertaken a Tier 2 controlled water risk assessment. The Tier 2 assessment has included a comparison of leachate analysis and groundwater samples to Environmental quality standards (EQS) in the first instance and where absent Drinking Water Standards (DWS).

These are presented in Table 4.4.



TABLE 4.4 COMPARISON OF GROUNDWATER AND LEACHATE ANALYSIS WITH TIER 1 SCREENING LEVELS

DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA								
Arsenic	µg/l	50	10	3	2.61	–	4	9.8	–	No Further Action
Cadmium	µg/l	0.08-0.25	5	3	0.04	–	4	0.14	TT102 – 3.60m	
Chromium (VI)	µg/l	3.4	–	3	<5.0	–	4	<5.0	–	No Further Action
Chromium (III)	µg/l	4.7	50	3	0.2	–	4	0.8	–	No Further Action
Copper	µg/l	1	2000	3	4.3	WS206 WS203 WS104	4	16 14 12 7.3	TT102 – 1.0m TT103 – 2.3m TT102 – 3.6m TT103 – 3.9m	Further Action
Total Cyanide	µg/l	1	50	3	4.2	WS203 WS104	4	22 11	TT102 – 3.6m TT103 – 2.3m	Further Action
Lead	µg/l	1.2	10	3	1.1	–	4	2.3 1.2	TT102 – 1.0m TT102 – 3.6m	Further Action
Mercury	µg/l	–	1.0	3	<0.05	–	4	<0.5	–	No Further Action
Nickel	µg/l	4	20	3	49	WS203 WS104	4	14 5.9	TT102 – 3.6m TT103 – 2.3m	Further Action
Selenium	µg/l	–	10	3	<0.6	–	4	<4.0	–	No Further Action
Zinc	µg/l	10.9	–	3	93	WS203 WS104	4	120 54	TT102 – 3.6m TT103 – 2.3m	Further Action
pH	6–9			3	7.2 - 7.4	–	4	7.1/8.2	–	No Further Action
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	10*	3	1.4	–	4	28	TT103 – 3.9m	Further Action
Anthracene	µg/l	0.1	10*	3	0.54	WS206 WS203 WS104	4	0.42	TT103 – 3.9m	Further Action



DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA								
Benzo[b]fluoranthene	µg/l	0.00017*	10*	3	1.2	WS206 WS203 WS104	4	<0.01	–	Further Action
Benzo[k]fluoranthene	µg/l	0.00017*	10*	3	0.36	WS206 WS203 WS104	4	<0.01	–	Further Action
Benzo(a)pyrene	µg/l	0.00017*	10*	3	0.94	WS206 WS203 WS104	4	<0.01	–	Further Action
Indeno(123-cd)pyrene	µg/l	0.00017*	10*	3	0.46	WS206 WS203 WS104	4	<0.01	–	Further Action
Fluoranthene	µg/l	0.0063	10*	3	2.5	WS206 WS203 WS104	4	2.5 1.2 0.33	TT102 – 3.6m TT103 – 2.3m TT103 – 3.9m	Further Action
Benzo(ghi)perylene	µg/l	1.7–4	10*	3	0.62	–	4	<0.01	–	Further Action
Aromatic Hydrocarbon										
TPH C5-C7 (benzene)	µg/l	10	1	3	<1.0	–	4	<1.0	–	No Further Action
TPH C7-C8 (toluene)	µg/l	74	700	3	<1.0	–	4	<1.0	–	No Further Action
TPH C8-C10 (xylene)	µg/l	30	300	3	<1.0	–	4	<1.0	–	No Further Action
TPH C10-C12 (naphthalene)	µg/l	2	90	3	<10	–	4	110 96 83	TT102 – 3.6m TT103 – 2.3m TT103 – 3.9m	Further Action
TPH C12-C16	µg/l	–	90	3	33	–	4	350 260	TT103 – 2.3m TT102 – 3.6m	Further Action



DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA								
								120	TT103 – 3.9m	
TPH C16-C35	µg/l	–	90	3	150	WS104	4	740 570 310	TT103 – 2.3m TT102 – 3.6m TT103 – 3.9m	Further Action
Aliphatic Hydrocarbon										
TPH C5-C6	µg/l	–	1000 ⁵	3	<1.0	–	4	<1.0	–	No Further Action
TPH C6-C8	µg/l	–	1000 ⁵	3	<1.0	–	4	<1.0	–	No Further Action
TPH C8-C10	µg/l	–	300	3	<1.0	–	4	<1.0	–	No Further Action
TPH C10-C12	µg/l	–	300	3	<10	–	4	<10	–	No Further Action
TPH C12-C16	µg/l	–	300	3	16	–	4	<10	–	No Further Action
TPH C16-C21	µg/l	–	300 ^{**}	3	56	–	4	<10	–	No Further Action
TPH C21-C35	µg/l	–	300 ^{**}	3	100	–	4	<10	–	No Further Action
Volatile Organic Compounds										
Tetrachloroethylene	µg/l	0.4	10	–	–	–	–	–	–	No Further Action
Trichloroethylene	µg/l	10	10	–	–	–	–	–	–	No Further Action
Trichlorobenzene	µg/l	0.4	–	–	–	–	–	–	–	No Further Action
Trichloromethane	µg/l	2.5	–	–	–	–	–	–	–	No Further Action
Dichloromethane	µg/l	20	200	–	–	–	–	–	–	No Further Action
Carbon Tetrachloride	µg/l	12	3	–	–	–	–	–	–	No Further Action
Vinyl Chloride	µg/l	–	0.3	–	–	–	–	–	–	No Further Action



4.2.1. CONTROLLED WATER RISK ASSESSMENT AND MITIGATION

For the Tier 2 assessment, E3P has compared the laboratory test data directly to the EQS values, which are for the protection of surface water quality.

This comparison indicates that the data exceeds for the following inorganic compounds:

- ✿ Copper
- ✿ Cadmium
- ✿ Total Cyanide
- ✿ Lead
- ✿ Nickel
- ✿ Zinc
- ✿ Naphthalene
- ✿ Anthracene
- ✿ Fluoranthene
- ✿ Benzo[b]fluoranthene
- ✿ Benzo[k]fluoranthene
- ✿ Benzo(a)pyrene
- ✿ Indeno(123-cd)pyrene
- ✿ TPH C10-C35 Aromatic

4.2.2. YSI SLOW FLOW DATA

During the return visits to monitor the wells, slow flow sampling with YSI monitoring was completed in addition to the water sampling by an E3P engineer. A summary of the data collected is presented in Table 4.5.

Table 4.5 Summary of YSI Data

Location	Depth Of Well (m)	Time (Mins)	Water Level (m bgl)	Temperature (°c)	Dissolved Oxygen	pH	Oxidation Reduction Potential (mV)
WS104	3.10	0	2.3	14.7	6.6	7.05	-51.4
		5	2.3	14.9	4.9	7.05	-47.1
		10	2.3	14.9	4.3	7.05	-42.7
		15	2.3	14.9	4	7.05	-41.5
		20	2.3	14.9	3.6	7.04	-42.2
WS204	4.50	0	2.83	12.9	45.5	6.84	-47.4
		5	2.9	13.8	39.5	6.84	-48
		10	2.94	14.6	39	6.84	-51
		15	2.97	14.3	38.4	6.88	-52.1

Location	Depth Of Well (m)	Time (Mins)	Water Level (m bgl)	Temperature (°c)	Dissolved Oxygen	pH	Oxidation Reduction Potential (mV)
		20	3	14.9	40.4	8.86	-50.3
WS206	4.50	0	0.9	13.4	5.6	7.01	-92.5
		5	0.9	13.9	4.1	7.04	-114.5
		10	0.9	13.6	3	7.07	-129.1
		15	0.9	13.6	2.7	7.07	-134.1
		20	0.9	13.6	2.7	7.06	-136.4

4.2.3. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

Inorganic determinants identified above are of a general low solubility and therefore low mobility, suggesting that the potential for migration towards a controlled water receptor is reduced.

Low permeability clay has been identified across the site beneath the Made Ground which will limit the potential for lateral and vertical migration.

Lead was identified in Table 4.4 to be elevated within soils and leachate analysis of the soils has shown there is a potential leachable risk of this contaminant. Where leachate analysis has been undertaken, this can overstate the risk due to the method of obtaining results modelling a worst-case scenario of mobilisation and is not wholly representative of the site characterisation. Therefore, following the receipt of supplementary groundwater samples, which have sampled the true dissolved phase impact, the lead impact is not considered to be a significant site contaminant source. However, other heavy metals such as copper, nickel and zinc were noted to be in exceedance of the EQS values within both soil leachate testing and groundwater testing. EQS values have been applied due to the presence of the nearby off-site surface water receptor, The Rochdale Canal.

Groundwater samples were obtained using a slow flow monitoring method which recorded SVOC impact within WS104, WS204 and WS206 and TPH impact within WS104 when compared with EQS values.

The proposed development within the area of impacted groundwater will remain as soft cover public open space which will not elevate rainwater infiltration to the underlying impacted soil and groundwater, resulting in a potential for further leaching of contaminants to offsite receptors (Rochdale Canal). Given that the site is underlain by low permeability clay deposits, the leaching of contaminants will be significantly reduced as the Made Ground will be contained above the natural clay aquitard. It is understood that the canal will be lined and not in hydraulic continuity with groundwater therefore the risk is reduced.

With regards to DWS values exceedances within groundwater samples were only observed within total cyanide, TPH C16-C35 and nickel.

With regards to the above, it is considered that the site poses a moderate risk to controlled waters.



4.2.4. CONCEPTUAL SITE MODEL

Following the completion of the intrusive site investigation, chemical analysis and risk assessment, the conceptual model shown in Table 4.6 has been prepared for the site.

TABLE 4.6 CONCEPTUAL MODEL

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL1 PL2	Heavy Metals, non-volatile PAH (Made Ground)	Dermal contact. Dermal contact and ingestion.	Future site users. Off-site receptors.	Likely	Moderate	LOW
<p>Assessment: Elevated concentrations of non-volatile PAH have been identified site-wide in Made Ground soils. No elevated concentrations of heavy metals are identified when compared to the GACs for a public open space end use.</p> <p>Recommendation: Risk can be mitigated through either hardstanding or the installation of a suitable cover system in all proposed landscaped areas and public open spaces to remove any potential for direct exposure to impacted soils and prevent exposure to future site users. Construction works should be completed with PPE and provision of welfare.</p>						
PL3	ACM in Made Ground	Inhalation of dust.	Future site users. Off-site land users.	Unlikely	Negligible	Negligible
<p>Assessment: Asbestos has not been identified within the samples tested and so the probability of any future risk is considered to be unlikely. Should any ACM be identified during the enabling works, these should be dealt with in accordance with protocol specified within the Control of Asbestos Regulations (2012) and industry best practice as detailed in CIRIA733 (Asbestos in Soil and Made Ground: A guide to understanding risk).</p> <p>Recommendation: No further assessment is required.</p>						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL4	Volatile Contaminants such as hydrocarbons (Made Ground)	Inhalation of vapours. Migration through permeable strata and preferential pathways.	Future site users. Off-site receptors.	Likely	Low	LOW
<p>Assessment: No elevated concentrations of volatile contaminants have been identified during the supplementary ground investigation. When compared to the GAC for a public open space end use, the previous investigation identified elevated naphthalene in WS104. Given the proposed end use as public open space there is considered to be a low risk to future site users.</p> <p>Recommendation: Visual and olfactory evidence of contamination has been identified in several locations, therefore a watching brief should be completed during remediation works to monitor the locations where visual or olfactory hydrocarbon impact has been identified during all phases of investigation completed to date.</p>						
PL4	Methane, carbon dioxide (Made Ground, potentially infilled features on and within 250 m of the site)	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Off-site land users.	Low likelihood	Moderate	LOW
<p>Assessment: Ground gas monitoring to date suggests that the site can be classified as CS1.</p> <p>Recommendation: No further action is required given no buildings are proposed and the ground gas monitoring has not identified a risk to future site users or off-site land users.</p>						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL5	Mobile contaminants (Made Ground)	Surface runoff. Migration through permeable strata and preferential pathways. Perched waters migration.	Groundwater (Principal and Secondary B aquifer). Surface water (Rochdale Canal).	Likely	Moderate	LOW
<p>Assessment: The controlled waters assessment has identified elevated heavy metals, PAH and TPH within the leachate and water samples taken from the site.</p> <p>The strata beneath the site are classified as secondary undifferential (Glacial Till) drift aquifer and secondary B (Manchester Marl) and principal (Sherwood Sandstone) aquifers in the solid strata. The site is not located within a Groundwater Source Protection Zone and there are no abstraction points within 1km of the site.</p> <p>The presence of Glacial Till underneath the Made Ground across the site will restrict vertical migration towards the Secondary A aquifer, as well as the lateral migration towards the adjacent canal.</p> <p>Recommendation: Recommended further sampling of groundwater and surface water to form a detailed controlled water assessment.</p>						
PL6	Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Likely	Moderate	LOW
<p>Assessment: Generally, soils at the site meet class DS-1, AC-1s.</p> <p>Elevated sulphate concentrations meeting Class DS-2, AC-1s were noted within the Made Ground deposits in WS102 and TT101. The Made Ground soils in WS105 meet Class DS-3, AC-1s.</p> <p>Recommendation: If any buildings are proposed, concrete should be designed in accordance with the chemical testing results.</p>						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL8	Phytotoxic contaminants (Made Ground)	Direct Contact (plant uptake).	Flora.	Likely	Low	LOW
<p>Assessment: Contamination has been encountered within shallow Made Ground across the site which may be taken up by flora in soft landscaping.</p> <p>Recommendation: Installation of a clean cover system within any areas of soft landscaping to prevent plant uptake of contaminants.</p>						

Main exposure pathways:

PL1 = soil ingestion; PL2 = dermal contact and ingestion; PL3 = Vapour/Gas Inhalation; PL4 = dust inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants.



5. CONCLUSIONS AND RECOMMENDATIONS

<p>Human Health</p>	<p>The supplementary Tier 2 assessment indicates that the data exceeds the screening criteria for a public open space end use for the following contaminants:</p> <ul style="list-style-type: none"> Non-volatile PAHs (Benzo(a)Anthracene, Chrysene, Benzo(b)Fluoranthene, Benzo(a)Pyrene, Dibenzo(a,h)Anthracene) <p>A number of SVOCs were identified above the limit of detection in TT102 at 3.60 m bgl and TT103 at 2.30 m bgl (including aniline, 2-methylnaphthalene, carbazole, anthraquinone and dibenzofuran), however, no screening criteria is available. These are not considered to pose a risk within the context of the developed CSM.</p> <p>1,3,5-Trimethylbenzene was also identified above the limit of detection in TT103 at 2.30 m bgl. No screening value is available, however, the minimal concentration (0.03 mg/kg) is not considered to pose a risk to future site users.</p> <p>Asbestos was not detected in any of the samples analysed.</p> <p>The identified elevated concentrations have primary exposure pathways related to dermal contact and ingestion of soils. The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAH compounds can be mitigated through either hardstanding or the installation of a suitable cover system in all proposed landscaped areas and public open space to remove any potential for direct exposure to impacted soils.</p> <p>The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy.</p>
<p>Controlled Waters</p>	<p>The controlled waters assessment has identified elevated heavy metals, PAH and TPH within the leachate and water samples taken from the site. The primary receptor is identified as the canal to the south.</p> <p>The site is not located within a groundwater source protection zone and there are no abstraction points within 1 km of the site, reducing the sensitivity of the receptor.</p> <p>Due to the exceedances of hydrocarbons noted in the soil, leachate and water samples, the risk to controlled waters is considered to be moderate. It is recommended that a detailed controlled waters risk assessment is completed to further assess the risk.</p> <p>The proposed development within the area of impacted groundwater will remain as soft cover public open space which will not elevate rainwater infiltration to the underlying impacted soil and groundwater, resulting in a potential for further leaching of contaminants to offsite receptors (Rochdale Canal). Given that the site is underlain by low permeability clay deposits, the leaching of contaminants will be significantly reduced as the Made Ground will be contained above the natural clay aquitard. It is understood that the canal will be lined and not in hydraulic continuity with groundwater therefore the risk is reduced</p> <p>The infilled canal on-site will need to be isolated to prevent ingress of water during remediation and construction works to reduce the spread of contamination to the wider environment.</p>



I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,
For and on behalf of E3P Ltd

Nicola Dawson
Geoenvironmental Project Manager

Enclosed:

Appendix I	Limitations
Appendix II	Glossary
Appendix III	Drawings
Appendix IV	Photographs
Appendix V	Exploratory Hole Logs
Appendix VI	Chemical Analysis Results
Appendix VII	Origin of Tier 1 Generic Assessment



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	WTE	Water table elevation



Jersey Street, Ancoats

Supplementary Geoenvironmental Site Assessment

December 2023

m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection

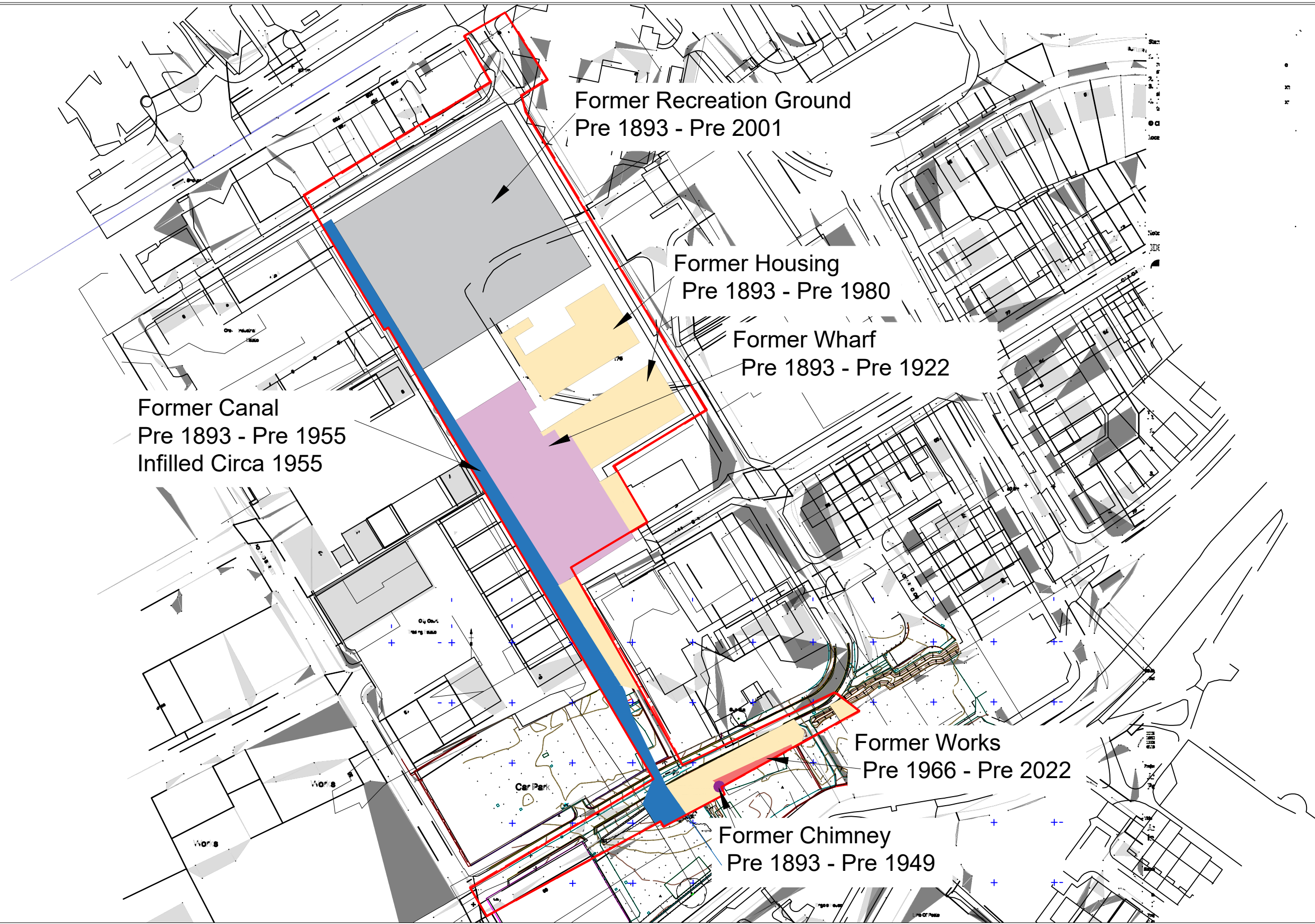


APPENDIX III

DRAWINGS

DRAWING 15-798-001 – SITE LOCATION PLAN





Site Features

- Former Canal
- Former Recreation Ground
- Former Chimney
- Former Housing
- Former Warf

Notes:

--	--	--	--	--

P1	REVA	09.01.2023	OW	HM
Phase	Issue	Date	Drawn	Checked

Client:

Civic Engineers

Jersey Street, Ancoats

Job No:

15-798
Drawing No:
003

Date:

09.01.2023
Scale:
NTS@ A3

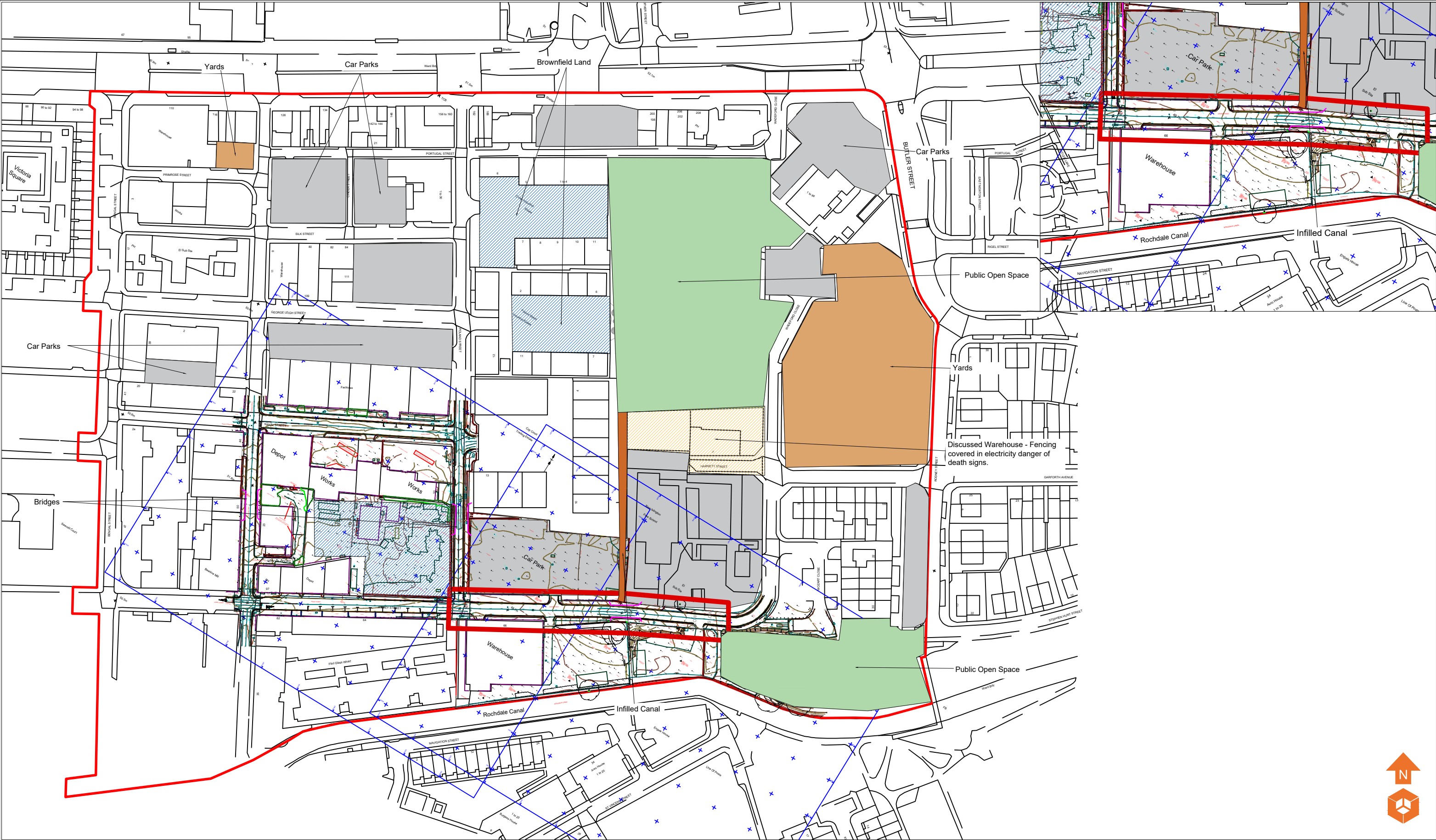
Drawing Title:

Historical Features Plan



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Site Features

- Infilled Canal
- Car Parking
- Public Open Space
- Yards
- Brownfield Land
- Discussed Warehouse

Notes:

P1	REVA	18.03.2022	EB	PW
Phase	Issue	Date	Drawn	Checked

Client:

Civic
Engineers

Job Title:

Jersey Street,
Ancoats

Job No:

15-798

Drawing No:

004

Date:

18.03.2022

Scale:

NTS@ A3

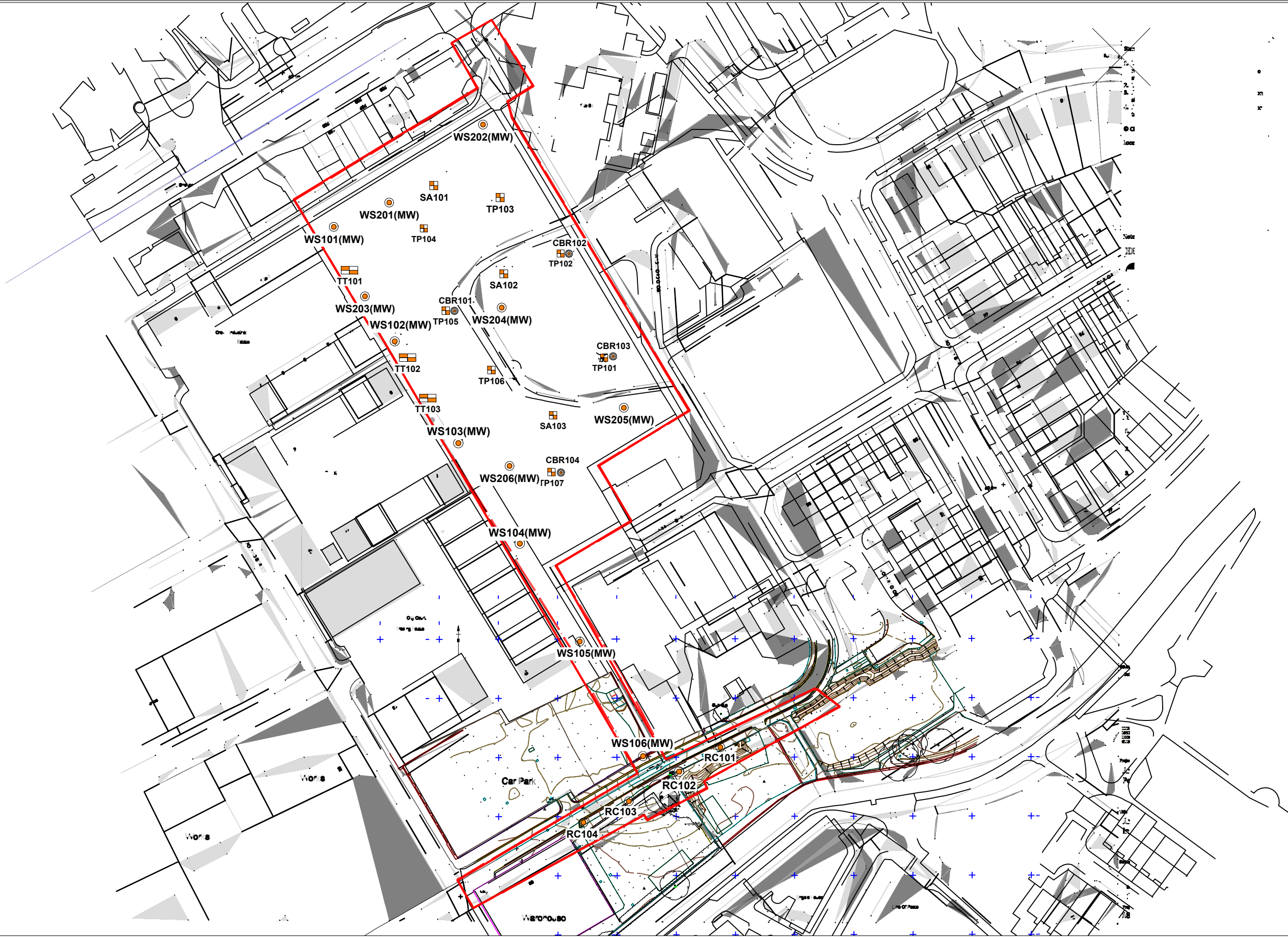
Drawing Title:

Site Features
Plan



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Location Symbols

- WS101 Approximate Window Sample Probehole Location
- TP101 Approximate Trial Pit Location
- SA101 Approximate Soakaway Test Location
- RC101 Approximate Rotary Borehole Location
- CBR101 Approximate California Bearing Ratio Test Location
- WS101 Approximate Window Sample Probehole Location
- WS101(MW) Approximate Window Sample Probehole Location with Install

Notes:

P1	REVD	18.07.2023	OW	NS
P1	REVC	20.06.2023	LM	ND
P1	REVB	24.01.2023	OW	HM
P1	REVA	06.01.2023	OW	HM
Phase	Issue	Date	Drawn	Checked

Client:

Civic
Engineers

Job Title:

Jersey Street,
Ancoats

Job No:

15-798

Drawing No:

005

Date:

18.07.2023

Scale:

NTS@ A3

Drawing Title:

Exploratory Hole Location Plan



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- Location Symbols
- WS101 Approximate Window Sample Probehole Location
 - TP101 Approximate Trial Pit Location
 - SA101 Approximate Soakaway Test Location
 - RC101 Approximate Rotary Borehole Location
 - Base of Made Ground Not Identified

- Made Ground Depth (m)
- Depth of Made Ground 0.90 - 1.19m
 - Depth of Made Ground 1.20 - 1.49m
 - Depth of Made Ground 1.50 - 1.79m
 - Depth of Made Ground 1.80 - 2.09m
 - Depth of Made Ground 2.10 - 2.39m
 - Depth of Made Ground >2.40m

Notes:				
P1	REVB	18.07.2023	OW	NS
P1	REVA	06.01.2023	EB	HM
Phase	Issue	Date	Drawn	Checked

Client:		Civic Engineers	
Job Title:		Jersey Street, Ancoats	

Job No:	15-798
Drawing No:	006

Date:	18.07.2023
Scale:	NTS@ A3

Drawing Title:	Depth of Made Ground Plan
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- Location Symbols**
- WS101 Approximate Window Sample Probehole Location
 - TP101 Approximate Trial Pit Location
 - SA101 Approximate Soakaway Test Location
 - RB101 Approximate Rotary Borehole Location

- Development Constraints**
- Heavy Metals
 - PAH
 - TPH
 - Napthalene
 - VOCs
 - SVOCs

Notes:

Client:

Civic
Engineers

Job No:

15-798

Date:

16.01.2023

Drawing No:

018

Scale:

NTS@ A3



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P1	REVA	16.01.2023	OW	HM
Phase	Issue	Date	Drawn	Checked

Job Title:

Jersey Street,
Ancoats

Drawing Title:

Contamination Issues
Plan

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APPENDIX IV

PHOTOGRAPHS

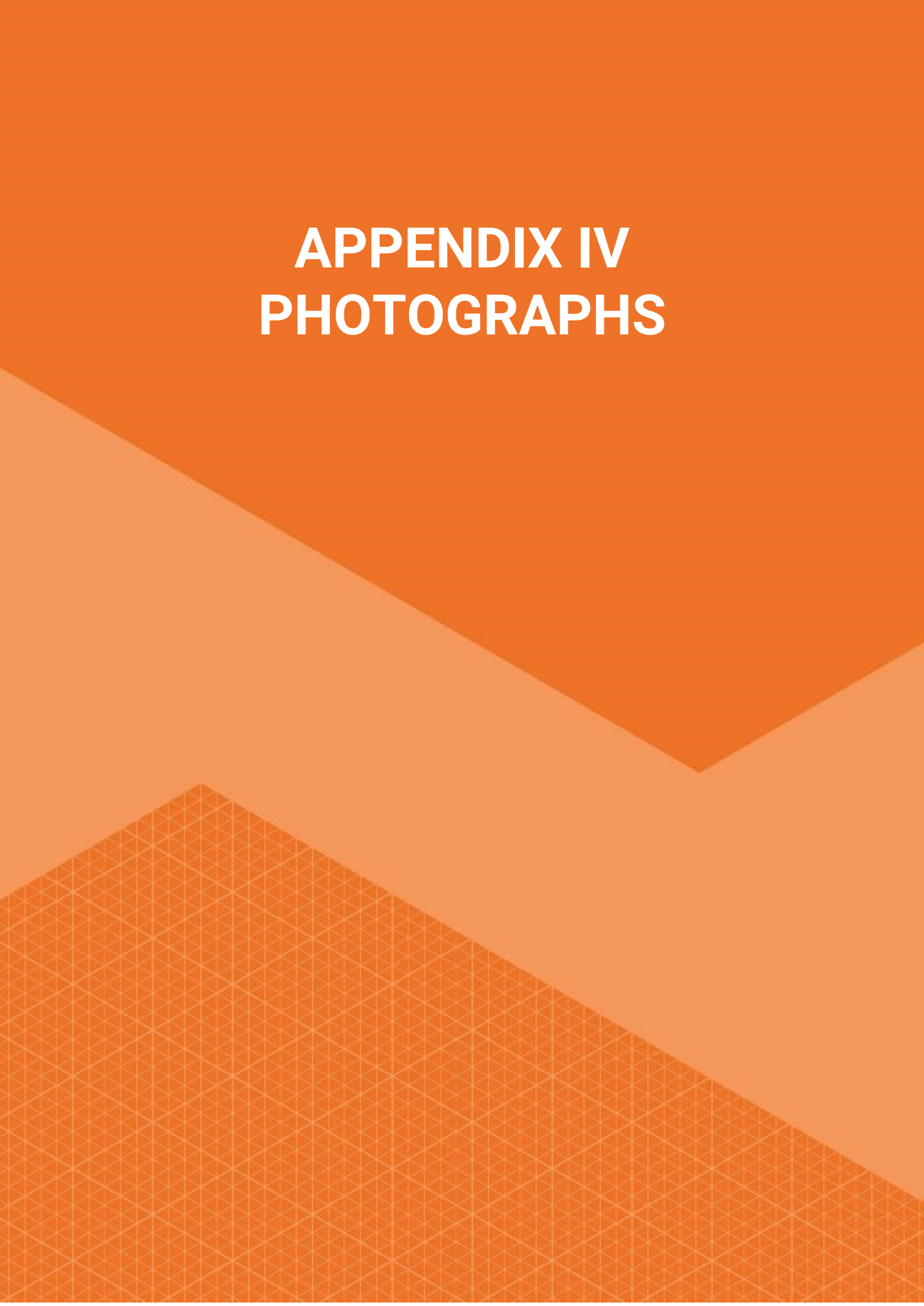
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PLATE 1 TT101 EXCAVATION



PLATE 2 TT102 ARISINGS



PLATE 3 TT103 EXCAVATION



PLATE 4 WS201 ARISINGS





WS205 ARISING



APPENDIX V

E3P EXPLORATORY HOLE

LOGS

Project Name: Jersey Street

Project No.
15798

Co-ords: 385168.00 - 398962.00
Level:

Date
24/05/2023

Location: Ancoats

Dimensions (m): 8.00

Scale
1:30

Client: Civic Engineers

Depth
4.10

0.70

Logged
H.Morgan

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	ES		0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
	1.50	B					MADE GROUND: Brown slightly clayey very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, concrete and brick. With frequent cobbles of sandstone and concrete.	1
				2.20				2
							MADE GROUND: Dark brown to black very sandy very gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, ceramic, brick and concrete. With constituents of metal, glass, wood and rubber.	3
▼ 3.50	3.50	ES						
▼ 3.90	4.00	HVP	70.32	3.90			Firm medium strength brown very sandy slightly	4

Trial Pit Photographs



TT101



TT101 spoil

Remarks: 1. Complete. 2. Strong hydrocarbon odour from 2.2 m bgl. 3. Hydrocarbon sheen from 2.2 m bgl. 4. Unstable from 2.1 m bgl.

Stability: Unstable.



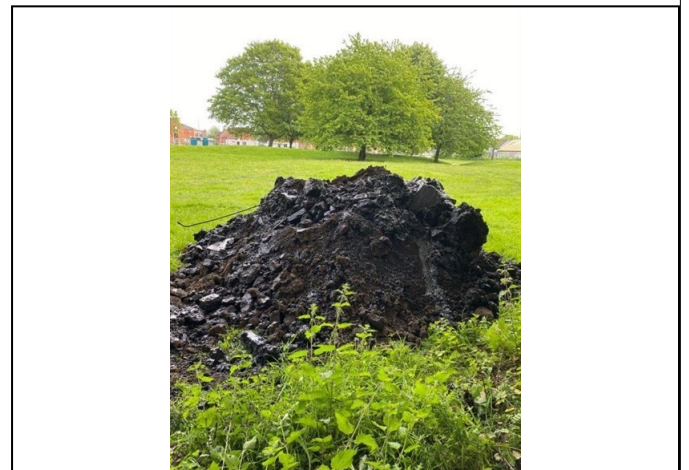
Project Name: Jersey Street	Project No. 15798	Co-ords: 385183.00 - 398941.00 Level:	Date 24/05/2023
Location: Ancoats	Dimensions (m): 7.50 Depth 3.90		Scale 1:30
Client: Civic Engineers			Logged H.Morgan

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 2.20	0.30						MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
	1.00	ES					MADE GROUND: Brown slightly clayey very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, concrete and brick. With frequent cobbles of concrete.	1
	2.20							2
	2.50	ES					MADE GROUND: Dark brown to black very sandy very gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, ceramic, brick and concrete. With constituents of metal, glass, wood, rubber and rebar.	3
	3.30	D						
	3.60	ES		3.60			MADE GROUND: Grey sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, ceramic, brick and concrete.	
	3.90			3.90			End of Pit at 3.90m	4

Trial Pit Photographs



TT102



TT102 spoil

Remarks: 1. Complete. 2. Strong hydrocarbon odour from 2.2 m bgl. 3. Hydrocarbon sheen from 2.2 m bgl. 4. Unstable from 2.2 m bgl. 5. Rapid water ingress from 2.2 m bgl.

Stability: Unstable.

Project Name: Jersey Street	Project No. 15798	Co-ords: 385202.00 - 398914.00 Level:	Date 24/05/2023
Location: Ancoats	Dimensions (m): 6.00 Depth 3.90		Scale 1:30
Client: Civic Engineers			Logged H.Morgan

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 2.70	0.50	ES		0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil). MADE GROUND: Brown slightly clayey very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, concrete and brick. With frequent cobbles of sandstone and concrete.	1
	2.30	ES		2.20			MADE GROUND: Dark brown to black very sandy very gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, ceramic, brick and concrete. With constituents of metal, glass, wood and rubber.	2
	2.50	D						3
	3.70	B		3.60			MADE GROUND: Grey sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, ceramic, brick and concrete.	
	3.90	ES		3.90			End of Pit at 3.90m	4

Trial Pit Photographs



TT103

TT103 spoil

Remarks: 1. Complete. 2. Strong hydrocarbon odour from 2.2 m bgl. 3. Hydrocarbon sheen from 2.2 m bgl. 4. Unstable from 2.2 m bgl. 5. Rapid water ingress from 2.7 m bgl.

Stability: Unstable.

Borehole Log

Borehole No.

WS201

Sheet 1 of 1

Project Name: Jersey Street

Project No.
15798

Co-ords: 385183.00 - 398977.00

Hole Type
WS

Location: Ancoats

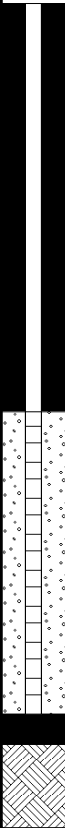
Level:

Scale
1:50

Client: Civic Engineers

Dates: 24/05/2023 -

Logged By
H.Morgan

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=22 (4,4/4,5,8,5)	0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
		1.00	D		1.00			MADE GROUND: Brown very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic.	1
		1.00							
		1.20	ES					MADE GROUND: Black slightly clayey very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick, glass and ceramic.	
		2.00	D	N=20 (12,11/8,5,4,3)					2
		2.00			2.50				
		2.80	ES	N=22 (4,4/5,5,6,6)				Very stiff high strength brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.	3
		3.00							
		4.00	D	N=25 (4,5/5,7,6,7)					4
		4.00							
		5.00	D	N=29 (4,5/6,7,8,8)					5
		5.00			5.45				
		End of borehole at 5.45 m							6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed.

Borehole Log

Borehole No.

WS202

Sheet 1 of 1

Project Name: Jersey Street

Project No.
15798

Co-ords: 385211.00 - 399005.00

Hole Type
WS

Location: Ancoats

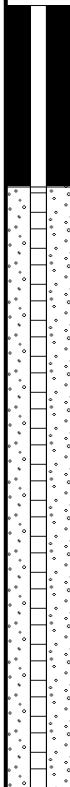
Level:

Scale
1:50

Client: Civic Engineers

Dates: 24/05/2023 -

Logged By
H.Morgan

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50	ES		0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
		1.00	D	N=22 (3,4/5,5,6,6)	1.10			MADE GROUND: Grey very gravelly fine to coarse sand. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and concrete.	1
		1.60	ES					Very stiff high strength brown sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone.	
		2.00	D	N=22 (3,4/5,5,6,6)					2
		3.00	D	N=23 (4,5/5,5,6,7)					3
		4.00	D	N=26 (4,5/5,6,7,8)					4
		5.00	D	N=28 (5,5/6,7,7,8)					5
		5.00			5.45				
								End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed.

Borehole Log

Borehole No.

WS203

Sheet 1 of 1

Project Name: Jersey Street

Project No.
15798

Co-ords: 385180.00 - 398950.00

Hole Type
WS

Location: Ancoats

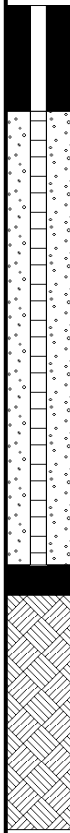
Level:

Scale
1:50

Client: Civic Engineers

Dates: 24/05/2023 -

Logged By
H.Morgan

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	1
					0.80			MADE GROUND: Grey very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone and limestone.	
		1.00		N=17 (3,1/3,5,5,4)				MADE GROUND: Brown slightly clayey very sandy gravel. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, concrete and brick.	
		2.00	D		2.20				2
		2.00		N=8 (3,1/1,1,3,3)					
		2.50	ES						
		3.00		N=6 (3,1/1,1,1,3)				MADE GROUND: Dark brown to black very sandy very gravelly clay. Gravel is fine to coarse angular to rounded of sandstone, mudstone, ceramic, brick and concrete.	3
		4.00	D		4.20				4
		4.00		N=17 (3,3/3,4,5,5)				Stiff medium strength brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded of sandstone and mudstone. Very stiff high strength from 5.00m bgl.	
		4.80	ES						5
		5.00		N=23 (4,5/5,5,6,7)					
					5.45			End of borehole at 5.45 m	
									6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed.

Borehole Log

Borehole No.

WS204

Sheet 1 of 1

Project Name: Jersey Street

Project No.
15798

Co-ords: 385216.00 - 398954.00

Hole Type
WS

Location: Ancoats

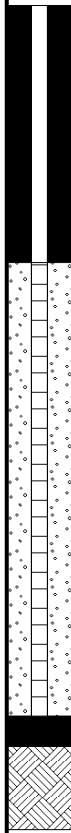
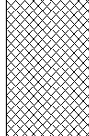
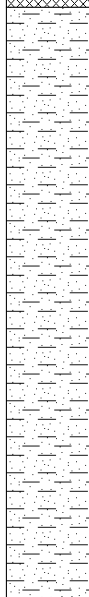
Level:

Scale
1:50

Client: Civic Engineers

Dates: 24/05/2023 -

Logged By
H.Morgan

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
		0.90	ES					MADE GROUND: Black very gravelly fine to coarse sand. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick, ash and clinker.	1
		1.00	D	N=8 (4,3/2,1,2,3)					
		1.00			1.50				
		2.00	ES	N=17 (2,3/4,4,4,5)				Very stiff high strength brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone.	2
		2.00							
		3.00	D	N=22 (4,4/5,5,6,6)					3
		3.00							
		4.00		N=23 (4,5/5,6,6,6)					4
		4.00							
		5.00	D	N=29 (5,6/6,7,8,8)					5
		5.00			5.45				
								End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed.

Borehole Log

Borehole No.

WS205

Sheet 1 of 1

Project Name: Jersey Street

Project No.
15798

Co-ords: 385260.00 - 398918.00

Hole Type
WS

Location: Ancoats

Level:

Scale
1:50

Client: Civic Engineers

Dates: 24/05/2023 -

Logged By
H.Morgan

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
		1.00		N=5 (1,0/1,0,1,3)				MADE GROUND: Black very gravelly fine to coarse sand. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick, ash and clinker.	1
		1.50	ES						
		2.00		N=9 (1,2/2,2,2,3)	2.00				2
		2.50	ES					Stiff medium strength brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. Very stiff high strength from 3.00m bgl.	
		3.00 3.00	D	N=22 (3,4/5,5,6,6)					3
		4.00 4.00	D	N=24 (4,4/6,6,6,6)					4
		5.00 5.00	D	N=27 (5,6/6,7,7,7)					5
					5.45			End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed.

Borehole Log

Borehole No.

WS206

Sheet 1 of 1

Project Name: Jersey Street

Project No.
15798

Co-ords: 385230.00 - 398895.00

Hole Type
WS

Location: Ancoats

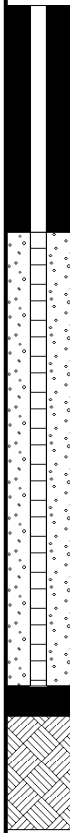
Level:

Scale
1:50

Client: Civic Engineers

Dates: 24/05/2023 -

Logged By
H.Morgan

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30			0.30			MADE GROUND: Dark brown sandy gravelly clay. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick and ceramic with frequent rootlets. (Topsoil).	
		0.50	ES					MADE GROUND: Black very gravelly fine to coarse sand. Gravel is fine to coarse angular to subrounded of sandstone, mudstone, brick, ash and clinker.	
		1.00	D	N=3 (1,0/1,1,0,1)	0.80			Soft very low strength brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded of sandstone and mudstone. Very stiff high strength at 2.00m bgl.	1
		1.00						Stiff medium strength at 3.00 m bgl. Very stiff high strength at 4.00 m bgl.	
		2.00		N=20 (3,3/4,4,6,6)					2
		2.50	ES						
		2.50	U						
		3.00	D	N=17 (3,4/4,4,4,5)					3
		3.00							
		4.00	D	N=22 (4,4/5,5,6,6)					4
		4.00							
		5.00	D	N=25 (4,5/5,6,7,7)					5
		5.00							
					5.45			End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Monitoring well installed.

APPENDIX VI CHEMICAL TESTING RESULTS

Henry Morgan
e3p
Taylor Road
Urmston
Manchester
M41 7JQ

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

e:

Analytical Report Number : 23-36215

Project / Site name:	Jersey Street, Ancost	Samples received on:	25/05/2023
Your job number:	15-798	Samples instructed on/ Analysis started on:	26/05/2023
Your order number:		Analysis completed by:	05/06/2023
Report Issue Number:	1	Report issued on:	06/06/2023
Samples Analysed:	4 leachate samples - 8 soil samples		


Signed:

Dominika Warjan
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number	2693742	2693743	2693744	2693745	2693746
Sample Reference	TT101	TT101	TT101	TT102	TT102
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	3.50	4.10	1.00	3.60
Date Sampled	25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	34
Total mass of sample received	kg	0.001	NONE	0.3	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	N/A	SCA	SCA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	7.5	8.7	8.4	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	2.9	5.5	< 1.0	8.1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	560	2500	430	670	1600
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0061	0.82	0.02	0.018	0.35
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	12	1600	40	36	700
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	6.1	824	19.8	17.8	350
Sulphide	mg/kg	1	NONE	< 1.0	180	4.5	2	100
Total Sulphur	mg/kg	50	MCERTS	360	11000	370	340	3000
Organic Matter	%	0.1	MCERTS	-	12	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.8	-	0.6	1.3	4.3
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	6.9	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	< 0.05	25	-	2.4	-
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	16	-	0.39	-
Acenaphthene	mg/kg	0.05	NONE	< 0.05	47	-	7.4	-
Fluorene	mg/kg	0.05	NONE	< 0.05	49	-	4.7	-
Phenanthrene	mg/kg	0.05	NONE	0.56	150	-	46	-
Anthracene	mg/kg	0.05	NONE	0.13	75	-	13	-
Fluoranthene	mg/kg	0.05	NONE	0.62	440	-	37	-
Pyrene	mg/kg	0.05	NONE	0.62	450	-	33	-
Benzo(a)anthracene	mg/kg	0.05	NONE	0.21	210	-	12	-
Chrysene	mg/kg	0.05	NONE	0.28	190	-	10	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.22	180	-	12	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.13	62	-	3.3	-
Benzo(a)pyrene	mg/kg	0.05	NONE	0.19	170	-	9.9	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	71	-	5.5	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	19	-	1.3	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	91	-	6.7	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	2.96	2250	-	205	-
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Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693742	2693743	2693744	2693745	2693746
Sample Reference				TT101	TT101	TT101	TT102	TT102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	3.50	4.10	1.00	3.60
Date Sampled				25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8	82	8	15	35
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.4	< 0.2	1.5
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	75	25	24	110
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	480	32	41	150
Lead (aqua regia extractable)	mg/kg	1	MCERTS	68	520	18	130	480
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	1.8	< 0.3	2.5	1.1
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	150	31	28	53
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	2.1	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	1100	59	87	420

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Toluene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Ethylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
p & m-xylene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
o-xylene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	NONE	-	-	3.3	-	1.7
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	NONE	-	-	5.5	-	11
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	NONE	-	-	< 8.0	-	20
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	NONE	-	-	< 8.0	-	110
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	-	-	14	-	140

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	NONE	-	-	< 1.0	-	20
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	NONE	-	-	< 2.0	-	67
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	NONE	-	-	< 10	-	150
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	NONE	-	-	< 10	-	170
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	-	-	< 10	-	410

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	-	< 1.0	-
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	-
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	-	< 0.1	-
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	NONE	3.4	3.4	-	3.4	-
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	NONE	7.1	93	-	13	-
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	NONE	3.1	750	-	43	-
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	NONE	< 1.0	1200	-	44	-
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	NONE	< 10	78	-	< 10	-
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	14	2100	-	110	-

VOCs

Chloromethane###	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Chloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Bromomethane###	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693742	2693743	2693744	2693745	2693746
Sample Reference				TT101	TT101	TT101	TT102	TT102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	3.50	4.10	1.00	3.60
Date Sampled				25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Vinyl Chloride	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1-Dichloroethene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1-Dichloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Trichloromethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1,1-Trichloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2-Dichloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1-Dichloropropene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Benzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Tetrachloromethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2-Dichloropropane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Trichloroethene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Dibromomethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Bromodichloromethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Toluene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1,2-Trichloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,3-Dichloropropane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Dibromochloromethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Tetrachloroethene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2-Dibromoethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Chlorobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Ethylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
p & m-Xylene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Styrene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Tribromomethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
o-Xylene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Isopropylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Bromobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
n-Propylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
2-Chlorotoluene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
4-Chlorotoluene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
tert-Butylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
sec-Butylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,3-Dichlorobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
p-Isopropyltoluene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2-Dichlorobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,4-Dichlorobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Butylbenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	NONE	-	-	< 5.0	-	< 5.0

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693742	2693743	2693744	2693745	2693746
Sample Reference				TT101	TT101	TT101	TT102	TT102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	3.50	4.10	1.00	3.60
Date Sampled				25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.05	NONE	-	-	< 0.05	-	< 0.05
Nitrobenzene	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.05	NONE	-	-	0.28	-	42
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	-	18
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.05	NONE	-	-	< 0.05	-	7.7
Acenaphthene	mg/kg	0.05	NONE	-	-	< 0.05	-	14
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	NONE	-	-	< 0.2	-	9.5
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
Fluorene	mg/kg	0.05	NONE	-	-	< 0.05	-	18
Azobenzene	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.05	NONE	-	-	0.07	-	62
Anthracene	mg/kg	0.05	NONE	-	-	< 0.05	-	18
Carbazole	mg/kg	0.3	NONE	-	-	< 0.3	-	4.6
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	NONE	-	-	< 0.3	-	2.1
Fluoranthene	mg/kg	0.05	NONE	-	-	0.06	-	45
Pyrene	mg/kg	0.05	NONE	-	-	0.07	-	43
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	< 0.05	-	17
Chrysene	mg/kg	0.05	NONE	-	-	< 0.05	-	17
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	< 0.05	-	16
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	< 0.05	-	5.1

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693742	2693743	2693744	2693745	2693746
Sample Reference				TT101	TT101	TT101	TT102	TT102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	3.50	4.10	1.00	3.60
Date Sampled				25/05/2023	25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	< 0.05	-	15
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	< 0.05	-	7
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	< 0.05	-	1.8
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	< 0.05	-	8.7

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693747	2693748	2693749
Sample Reference				TT103	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	24	17
Total mass of sample received	kg	0.001	NONE	0.3	0.3	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	7.8	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	6.7	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1200	1800	250
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.052	0.41	0.0068
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	100	820	14
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	51.6	412	6.8
Sulphide	mg/kg	1	NONE	120	110	1.5
Total Sulphur	mg/kg	50	MCERTS	980	1900	200
Organic Matter	%	0.1	MCERTS	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.1	4.6	0.9
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	3.8	1.1
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	4.1	-	44
Acenaphthylene	mg/kg	0.05	NONE	0.35	-	2.3
Acenaphthene	mg/kg	0.05	NONE	2.1	-	1.3
Fluorene	mg/kg	0.05	NONE	1.5	-	1.2
Phenanthrene	mg/kg	0.05	NONE	11	-	0.6
Anthracene	mg/kg	0.05	NONE	2.5	-	0.12
Fluoranthene	mg/kg	0.05	NONE	12	-	0.14
Pyrene	mg/kg	0.05	NONE	12	-	0.17
Benzo(a)anthracene	mg/kg	0.05	NONE	5.5	-	< 0.05
Chrysene	mg/kg	0.05	NONE	5.3	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	NONE	6.2	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	NONE	2	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	5.1	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	2.5	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.71	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	3.1	-	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	76.5	-	49.5
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Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693747	2693748	2693749
Sample Reference				TT103	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	24	34	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	2.7	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	47	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	79	210	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	230	240	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.5	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	36	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	190	830	62

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	83	-
Toluene	µg/kg	5	NONE	-	84	-
Ethylbenzene	µg/kg	5	NONE	-	110	-
p & m-xylene	µg/kg	5	NONE	-	150	-
o-xylene	µg/kg	5	NONE	-	98	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	< 5.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	NONE	-	9.5	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	NONE	-	33	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	NONE	-	61	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	NONE	-	530	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	-	630	-

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	-	0.082	-
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	-	0.087	-
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	-	0.37	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	NONE	-	100	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	NONE	-	260	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	NONE	-	560	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	NONE	-	740	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	-	1700	-

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	-	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	-	0.2
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	-	0.3
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	NONE	2.8	-	10
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	NONE	7.7	-	9.7
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	NONE	31	-	3.3
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	NONE	150	-	2.4
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	NONE	53	-	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	250	-	26

VOCs

Chloromethane###	µg/kg	5	NONE	-	< 5.0	-
Chloroethane	µg/kg	5	NONE	-	< 5.0	-
Bromomethane###	µg/kg	5	NONE	-	< 5.0	-

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693747	2693748	2693749
Sample Reference				TT103	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Vinyl Chloride	µg/kg	5	NONE	-	< 5.0	-
Trichlorofluoromethane	µg/kg	5	NONE	-	< 5.0	-
1,1-Dichloroethene	µg/kg	5	NONE	-	< 5.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	< 5.0	-
Cis-1,2-dichloroethene	µg/kg	5	NONE	-	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	< 5.0	-
1,1-Dichloroethane	µg/kg	5	NONE	-	< 5.0	-
2,2-Dichloropropane	µg/kg	5	NONE	-	< 5.0	-
Trichloromethane	µg/kg	5	NONE	-	< 5.0	-
1,1,1-Trichloroethane	µg/kg	5	NONE	-	< 5.0	-
1,2-Dichloroethane	µg/kg	5	NONE	-	< 5.0	-
1,1-Dichloropropene	µg/kg	5	NONE	-	< 5.0	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	< 5.0	-
Benzene	µg/kg	5	NONE	-	83	-
Tetrachloromethane	µg/kg	5	NONE	-	< 5.0	-
1,2-Dichloropropane	µg/kg	5	NONE	-	< 5.0	-
Trichloroethene	µg/kg	5	NONE	-	< 5.0	-
Dibromomethane	µg/kg	5	NONE	-	< 5.0	-
Bromodichloromethane	µg/kg	5	NONE	-	< 5.0	-
Cis-1,3-dichloropropene	µg/kg	5	NONE	-	< 5.0	-
Trans-1,3-dichloropropene	µg/kg	5	NONE	-	< 5.0	-
Toluene	µg/kg	5	NONE	-	84	-
1,1,2-Trichloroethane	µg/kg	5	NONE	-	< 5.0	-
1,3-Dichloropropane	µg/kg	5	NONE	-	< 5.0	-
Dibromochloromethane	µg/kg	5	NONE	-	< 5.0	-
Tetrachloroethene	µg/kg	5	NONE	-	< 5.0	-
1,2-Dibromoethane	µg/kg	5	NONE	-	< 5.0	-
Chlorobenzene	µg/kg	5	NONE	-	< 5.0	-
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	-	< 5.0	-
Ethylbenzene	µg/kg	5	NONE	-	110	-
p & m-Xylene	µg/kg	5	NONE	-	150	-
Styrene	µg/kg	5	NONE	-	< 5.0	-
Tribromomethane	µg/kg	5	NONE	-	< 5.0	-
o-Xylene	µg/kg	5	NONE	-	98	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	< 5.0	-
Isopropylbenzene	µg/kg	5	NONE	-	< 5.0	-
Bromobenzene	µg/kg	5	NONE	-	< 5.0	-
n-Propylbenzene	µg/kg	5	NONE	-	< 5.0	-
2-Chlorotoluene	µg/kg	5	NONE	-	< 5.0	-
4-Chlorotoluene	µg/kg	5	NONE	-	< 5.0	-
1,3,5-Trimethylbenzene	µg/kg	5	NONE	-	30	-
tert-Butylbenzene	µg/kg	5	NONE	-	< 5.0	-
1,2,4-Trimethylbenzene	µg/kg	5	NONE	-	81	-
sec-Butylbenzene	µg/kg	5	NONE	-	< 5.0	-
1,3-Dichlorobenzene	µg/kg	5	NONE	-	< 5.0	-
p-Isopropyltoluene	µg/kg	5	NONE	-	< 5.0	-
1,2-Dichlorobenzene	µg/kg	5	NONE	-	< 5.0	-
1,4-Dichlorobenzene	µg/kg	5	NONE	-	< 5.0	-
Butylbenzene	µg/kg	5	NONE	-	< 5.0	-
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	-	< 5.0	-
1,2,4-Trichlorobenzene	µg/kg	5	NONE	-	< 5.0	-
Hexachlorobutadiene	µg/kg	5	NONE	-	< 5.0	-
1,2,3-Trichlorobenzene	µg/kg	5	NONE	-	< 5.0	-

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693747	2693748	2693749
Sample Reference				TT103	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

SVOCs

Aniline	mg/kg	0.1	NONE	-	11	-
Phenol	mg/kg	0.2	NONE	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	NONE	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	NONE	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	NONE	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	NONE	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-
Isophorone	mg/kg	0.2	NONE	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	NONE	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	< 0.3	-
Naphthalene	mg/kg	0.05	NONE	-	140	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	65	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	NONE	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	NONE	-	31	-
Acenaphthene	mg/kg	0.05	NONE	-	54	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	NONE	-	36	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	NONE	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	NONE	-	< 0.2	-
Fluorene	mg/kg	0.05	NONE	-	66	-
Azobenzene	mg/kg	0.3	NONE	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	< 0.3	-
Phenanthrene	mg/kg	0.05	NONE	-	260	-
Anthracene	mg/kg	0.05	NONE	-	77	-
Carbazole	mg/kg	0.3	NONE	-	23	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	< 0.2	-
Anthraquinone	mg/kg	0.3	NONE	-	8.2	-
Fluoranthene	mg/kg	0.05	NONE	-	230	-
Pyrene	mg/kg	0.05	NONE	-	210	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	85	-
Chrysene	mg/kg	0.05	NONE	-	77	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	71	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	36	-

Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693747	2693748	2693749
Sample Reference				TT103	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Benzo(a)pyrene	mg/kg	0.05	NONE	-	70	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	36	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	8.9	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	41	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693750	2693751	2693752	2693753
Sample Reference				TT102	TT102	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	3.60	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status	

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	8.1	7.1	7.7	8.2
Total Cyanide	µg/l	10	ISO 17025	< 10	11	22	< 10

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	73	150	51
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	28
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	3.1	9.7	3.3
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	29	23	2.2
Fluorene	µg/l	0.01	ISO 17025	< 0.01	0.45	10	2.2
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	2
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.42
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	2.5	1.2	0.33
Pyrene	µg/l	0.01	ISO 17025	< 0.01	1.2	0.71	0.3
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	36	45	39
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	3.1	9.6	9.8	3.2
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	0.14	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.8	< 0.4	< 0.4	< 0.4
Copper (dissolved)	µg/l	0.7	ISO 17025	16	12	14	7.3
Lead (dissolved)	µg/l	1	ISO 17025	2.3	1.2	< 1.0	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.6	14	5.9	0.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	10	120	54	9

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10

Petroleum Hydrocarbons

TPH1 (C10 - C40) <small>EH_ID_TOTAL_MS</small>	µg/l	10	NONE	< 10	570	740	310
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Analytical Report Number: 23-36215
Project / Site name: Jersey Street, Ancost

Lab Sample Number				2693750	2693751	2693752	2693753
Sample Reference				TT102	TT102	TT103	TT103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	3.60	2.30	3.90
Date Sampled				25/05/2023	25/05/2023	25/05/2023	25/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status				
TPH-CWG - Aliphatic >C5 - C6 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0#
TPH-CWG - Aliphatic >C6 - C8 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0#
TPH-CWG - Aliphatic >C8 - C10 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0#
TPH-CWG - Aliphatic >C10 - C12 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	110	83	96
TPH-CWG - Aromatic >C12 - C16 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	260	350	120
TPH-CWG - Aromatic >C16 - C21 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	200	310	90
TPH-CWG - Aromatic >C21 - C35 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) _{HS+EH_ID_AR_MS}	µg/l	10	NONE	< 10	570	740	310

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-36215

Project / Site name: Jersey Street, Ancost

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2693742	TT101	None Supplied	0.5	Brown clay and loam with gravel and vegetation.
2693743	TT101	None Supplied	3.5	Grey clay and sand with gravel and coal.
2693744	TT101	None Supplied	4.1	Brown sandy clay.
2693745	TT102	None Supplied	1	Brown loam and clay with gravel and vegetation.
2693746	TT102	None Supplied	3.6	Grey clay.
2693747	TT103	None Supplied	0.5	Brown loam and sand with gravel and vegetation.
2693748	TT103	None Supplied	2.3	Brown clay and sand with gravel.
2693749	TT103	None Supplied	3.9	Brown clay.

Analytical Report Number : 23-36215

Project / Site name: Jersey Street, Ancost

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

Analytical Report Number : 23-36215

Project / Site name: Jersey Street, Ancost

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	NONE
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 23-36215
Project / Site name: Jersey Street, Ancost

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

#Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and therefore may be compromised.

###Quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.



4041



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e:

Analytical Report Number : 23-44548-2

Replaces Analytical Report Number: 23-44548, issue no. 1
Client sampling date amended.
Sampling date added as per client's request.

Project / Site name:	Jersey Street	Samples received on:	12/07/2023
Your job number:	15-798	Samples instructed on/ Analysis started on:	12/07/2023
Your order number:	005488	Analysis completed by:	18/07/2023
Report Issue Number:	2	Report issued on:	19/07/2023
Samples Analysed:	3 water samples		


Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 23-44548

Project / Site name: Jersey Street

Your Order No: 005488

Lab Sample Number	2745381	2745382	2745383
Sample Reference	WS206	WS203	WS104
Sample Number	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied
Date Sampled	11/07/2023	11/07/2023	11/07/2023
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.2	7.2	7.4
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	3.3	4.2
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	8.88	7.69	4.83

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	1.5	1.8	2.1
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	180	120	100
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.18	2.61	1.51
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02	0.04	0.04
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	4.3	3.2	3.8
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2	1.1	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	1000	1600	290
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.5	49	6.9
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	8	55	93

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) <small>EH_ID_TOTAL_MS</small>	µg/l	10	ISO 17025	< 10	180	420
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TPH-CWG - Aliphatic# # >C5 - C6 <small>HS_ID_AL</small>	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic# # >C6 - C8 <small>HS_ID_AL</small>	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic# # >C8 - C10 <small>HS_ID_AL</small>	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 <small>EH_ID_AL_MS</small>	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 <small>EH_ID_AL_MS</small>	µg/l	10	NONE	< 10	< 10	16
TPH-CWG - Aliphatic >C16 - C21 <small>EH_ID_AL_MS</small>	µg/l	10	NONE	< 10	< 10	56
TPH-CWG - Aliphatic >C21 - C35 <small>EH_ID_AL_MS</small>	µg/l	10	NONE	< 10	< 10	100
TPH-CWG - Aliphatic (C5 - C35) <small>HS+EH_ID_AL_MS</small>	µg/l	10	NONE	< 10	< 10	170

TPH-CWG - Aromatic >C5 - C7 <small>HS_ID_AR</small>	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 <small>HS_ID_AR</small>	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 <small>HS_ID_AR</small>	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 <small>EH_ID_AR_MS</small>	µg/l	10	NONE	< 10	< 10	10
TPH-CWG - Aromatic >C12 - C16 <small>EH_ID_AR_MS</small>	µg/l	10	NONE	< 10	33	24
TPH-CWG - Aromatic >C16 - C21 <small>EH_ID_AR_MS</small>	µg/l	10	NONE	< 10	63	60
TPH-CWG - Aromatic >C21 - C35 <small>EH_ID_AR_MS</small>	µg/l	10	NONE	< 10	88	150
TPH-CWG - Aromatic (C5 - C35) <small>HS+EH_ID_AR_MS</small>	µg/l	10	NONE	< 10	180	240



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Analytical Report Number: 23-44548

Project / Site name: Jersey Street

Your Order No: 005488

Lab Sample Number				2745381	2745382	2745383
Sample Reference				WS206	WS203	WS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				11/07/2023	11/07/2023	11/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0



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Analytical Report Number: 23-44548

Project / Site name: Jersey Street

Your Order No: 005488

Lab Sample Number				2745381	2745382	2745383
Sample Reference				WS206	WS203	WS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				11/07/2023	11/07/2023	11/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	2.3	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	0.5	0.53	1.4
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	0.19	0.15
Acenaphthene	µg/l	0.01	ISO 17025	0.21	1.7	0.82
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	0.13	0.22	0.55
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	0.7	0.74	1.3
Anthracene	µg/l	0.01	ISO 17025	0.3	0.3	0.54
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	1.3	1.6	2.5
Pyrene	µg/l	0.01	ISO 17025	1.4	1.6	2.4

Analytical Report Number: 23-44548
Project / Site name: Jersey Street

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Lab Sample Number				2745381	2745382	2745383
Sample Reference				WS206	WS203	WS104
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				11/07/2023	11/07/2023	11/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	0.62	0.81	0.97
Chrysene	µg/l	0.01	ISO 17025	0.78	0.99	1
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	0.74	0.79	1.2
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	0.31	0.36	0.31
Benzo(a)pyrene	µg/l	0.01	ISO 17025	0.55	0.71	0.94
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	0.24	0.33	0.46
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	0.32	0.43	0.62
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-44548

Project / Site name: Jersey Street

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

Analytical Report Number : 23-44548

Project / Site name: Jersey Street

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

- Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

APPENDIX VII

ORIGIN OF TIER I GENERIC ASSESSMENT CRITERIA

CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	2014 LQM/CIEH S4ULs
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Suitable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene ⁽ⁱⁱⁱ⁾	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C ₅ -C ₆ (aliphatic)	
TPH C ₆ -C ₈ (aliphatic)	
TPH C ₈ -C ₁₀ (aliphatic)	
TPH C ₁₀ -C ₁₂ (aliphatic)	
TPH C ₁₂ -C ₁₆ (aromatic)	
TPH C ₁₆ -C ₂₁ (aromatic)	
TPH C ₂₁ -C ₃₅ (aromatic)	

